U.S. Coast and Geodetic
Survey
Terrestrial magnetism

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY
O. H. TITTMANN
SUPERINTENDENT

TERRESTRIAL MAGNETISM

RESULTS OF MAGNETIC OBSERVATIONS MADE BY THE UNITED STATES COAST AND GEODETIC SURVEY IN 1913

BY

R. L. FARIS
Inspector of Magnetic Work; Chief, Division of Terrestrial Magnetism
U. S. Coast and Geodetic Survey

SPECIAL PUBLICATION No. 20

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INTRODUCTION.

In 1882 the results of magnetic observations made by this Bureau prior to 1881, together with descriptions of station, were published as Appendix 9, Report for 1881. From that time to 1902 the results were published only in connection with a discussion of the distribution or secular change of one or more of the three magnetic elements. In "Magnetic Declination Tables and Isogonic Charts for 1902" declination results were given for all stations occupied up to that time and descriptions were given of the stations occupied subsequent to 1881. From 1903 to 1911 there was published annually an appendix to the Superintendent's report, giving the results of magnetic observations made during the fiscal year (July to June) covered by the report.

When, in 1912, it was decided to confine the annual report of the Superintendent to administrative matters and to publish separately the scientific results which had formerly appeared as appendixes to the report, the time was deemed opportune to change from the *fiscal* year to the *calendar* year in the publication of the results of magnetic observations. Accordingly, Special Publication No. 15 contained the results of observations made between July 1, 1911, and December 31, 1912.

The present publication contains the results of observations made during the calendar year 1913, together with the results of observations made in the Philippine Islands in 1912, most of which were received too late to be included in Special Publication No. 15.

Five magnetic observatories have been in operation throughout the year: At Cheltenham, Md.; Sitka, Alaska; near Honolulu, Hawaii; on Vieques Island, P. R.; and near Tucson, Ariz. Their records have furnished means for reducing to mean of day the values of declination obtained from the field observations. There will be found in the tables the values of the magnetic elements for each of the observatories for the year 1913.

OBSERVATIONS ON LAND AND THEIR DISTRIBUTION.

The distribution of the stations on land is shown in the following table, from which it will be seen that observations were made in 28 States and Territories. Numerous old stations were reoccupied in order to determine the secular change of the magnetic elements. At the request of Prof. T. A. Jaggar, director of the Hawaiian volcano observatory, a detailed magnetic survey was made of the crater of Kilauea. Observations were made at many places in the vicinity of Wilmington, Del., in order to determine the extent of the local disturbance known to exist in that area. Auxiliary stations were also established in several places in Michigan and Wisconsin, where previous observations had indicated the presence of local disturbance.

Summary of results on land.

State	Localities	Stations	Old localities reoccupied	Declination results	Dip results	Intensity results
Alaska	25	26	3	27	7	6
Arizona	1	1	1	1	1	1
Arkansas	9	10	1	10	9	9
Colorado	19	19	3	19	19	19
Connecticut	5	5	1	5	5	5
Delaware	21	21	0	21	21	21
Hawaii	18	40	8	37	36	36
Idaho	1	1	0	1	1	1
Maryland	1	1	1	5	6	7
Massachusetts	10	10	2	10	9	10
Michigan	9	11	1	11	9	9
Minnesota	4	4	0	4	4	4
Missouri	1	2	1	2	2	1
Montana	2	2	1	2	2	2
Nebraska	3	3	1	3	3	3
New Hampshire	6	6	0	6	6	6
New Jersey	8	8	0	8	8	8
New York	9	9	1	9	9	9
North Carolina	7	7	1	7	7	7
Ohio	3	3	1	3	3	3
Pennsylvania	8	10	3	10	10	10
Philippine Islands	43	49	23	50	36	38
Porto Rico	1	1	1	1	1	1
Utah	8	8	2	8	8	8
Vermont	3	3	1	3	3	3
Virginia	1	1	1	1	1	1
Washington	1	1	1	2	2	2
Wisconsin	18	20	3	20	19	19
Total	245	282	62	286	247	249

SECULAR CHANGE OF THE MAGNETIC DECLINATION.

A comparison of the declination results at "repeat" stations occupied during the year (also those in the Philippine Islands in 1912) with the results of earlier observations in the same localities is presented in the following table. The letter after the name of a station indicates (*a*) that the old station was reoccupied exactly, (*b*) that the new station was very near the old one, and (*c*) that the new station was some distance (a quarter of a mile or more) from the old one. A tabular value of annual change refers approximately to the middle of the period from which it is derived. A plus sign indicates increasing east declination or decreasing west declination, a minus sign the reverse.

Comparison of declination results at repeat stations.

State and station	Former observation		Last observation		Average annual change
	Date	Declination	Date	Declination	
		° ′		° ′	′
Vermont:					
Rutland (*a*)	1910, Au	13 00.0 W	1913, Au	13 10.1 W	−3.4
Massachusetts:					
Boston (*a*)	1909, Jy	13 18.5 W	1913, Je	13 47.4 W	−7.4
Worcester (*a*)	1910, Se	12 35.8 W	1913, Jy	13 00.6 W	−8.8
Connecticut:					
Canaan (*a*)	1910, Jy	11 35.8 W	1913, Au	11 49.3 W	−4.4
New York:					
Plattsburg (*a*)	1907, Au	11 58.8 W	1913, Se	12 37.2 W	−6.3
Pennsylvania:					
Tunkhannock (*a*)	1910, Au	8 24.0 W	1913, My	8 44.9 W	−7.6
Franklin (*a*)	1902, No	4 09.4 W	1913, Je	4 47.5 W	−3.6
Meadville (*b*)	1910, Je	4 35.4 W	1913, Je	4 48.3 W	−4.3

Comparison of declination results at repeat stations—Continued.

State and station	Former observation		Last observation		Average annual change
	Date	Declination	Date	Declination	
		° ′		° ′	′
Maryland:					
Cheltenham (*a*)	1912 year	5 50.0 W	1913 year	5 54.5 W	−4.5
Virginia:					
Cape Charles (*a*)	1910, Oc	5 00.8 W	1913, Jy	5 17.8 W	−6.2
North Carolina:					
Raleigh (*a*)	1906, Au	2 21.8 W	1913, Je	2 48.0 W	−3.8
Ohio:					
Toledo (*a*)	1910, Au	1 19.6 W	1913, Je	1 26.6 W	−2.5
Michigan:					
Kalamazoo (*a*)	1910, Au	1 09.4 E	1913, Jy	1 05.4 E	−1.4
Wisconsin:					
Green Bay (*c*)	1908, Au	3 20.4 E	1913, Au	3 14.8 E	−1.1
Appleton (*a*)	1908, Au	2 42.0 E	1913, Au	2 29.3 E	−2.5
Ladysmith (*a*)	1907, Au	4 30.9 E	1913, Se	4 20.8 E	−1.7
Nebraska:					
Lincoln (*a*)	1911, Je	10 10.7 E	1913, Je	10 00.4 E	−5.2?
Missouri:					
Kansas City (*a*)	1907, Je	9 12.1 E	1913, Oc	9 19.7 E	+1.2
Arkansas:					
Huntsville (*c*)	1905, No	7 32.5 E	1913, No	7 44.3 E	+1.5
Arizona:					
Tucson (*a*)	1912 year	13 33.6 E	1913 year	13 37.0 E	+3.4
Colorado:					
Greeley (*b*)	1910, Au	14 25.8 E	1913, Je	14 25.6 E	−0.1
Durango (*a*)	1905, Oc	14 03.9 E	1913, Jy	14 35.3 E	+4.0
Grand Junction (*a*)	1910, Au	15 27.8 E	1913, Au	15 35.4 E	+2.5
Utah:					
Green River (*a*)	1910, Au	16 01.8 E	1913, Au	16 09.2 E	+2.5
Ogden (*a*)	1910, Au	18 01.0 E	1913, Au	18 09.6 E	+2.9
Montana:					
Helena (*a*)	1910, Jy	20 05.2 E	1913, Se	20 09.4 E	+1.4
Washington:					
Seattle (*a*)	1910, Jy	23 38.6 E	1913, Ap	23 44.4 E	+2.1
Alaska:					
Sitka Obs'y (*a*)	1912 year	30 20.9 E	1913 year	30 22.1 E	+1.2
Dutch Harbor (*a*)	1909, My, Se.	17 33.8 E	1913, My, Se.	17 26.0 E	−2.0
Hawaii:					
Honolulu Obs'y (*a*)	1912 year	9 34.8 E	1913 year	9 37.3 E	+2.5
Waimea (*b*)	1906, My	10 10.9 E	1913, Au	10 18.1 E	+1.0
Lahaina (*a*)	1906, My	9 28.7 E	1913, Au	9 35.7 E	+1.0
Hilo, old (*a*)	1906, Ap	8 49.4 E	1913, Au	9 07.9 E	+2.5
Hilo, new (*a*)	1906, Ap	8 46.8 E	1913, Au	9 04.4 E	+2.4
Kapoho (*a*)	1906, Ap	9 31.1 E	1913, Au	9 48.4 E	+2.4
Kilauea (*a*)	1906, Ap	9 48.8 E	1913, Au	10 08.8 E	+2.7
Ka Lae (*a*)	1906, Ap	9 58.6 E	1913, Au	10 11.6 E	+1.8
		° ′		° ′	′
Philippine Islands:					
Vigan (*b*)	1903, Fe	0 25.6 E	1912, Ap	0 19.2 E	−0.7
Aparri (*b*)	1901, Mh	0 10.3 E	1912, Ap	0 05.2 E	−0.5
Manila (*c*)	1902, Je	0 53.2 E	1912, Mh	0 50.4 E	−0.3
Batangas (*b*)	1903, Ap	0 46.1 E	1912, My	0 50.4 E	+0.5
Atimonan (*a*)	1907, Se	0 46.0 E	1912, No	0 42.5 E	−0.7
Calapan (*b*)	1903, Mh	1 08.5 E	1912, No	1 10.2 E	+0.2
Boac (*a*)	1903, My	0 52.2 E	1912, Oc	0 58.2 E	+0.6
Romblon (*a*)	1908, Mh	1 04.4 E	1912, No	1 06.3 E	+0.4
Legaspi (*b*)	1902, Je	0 30.5 E	1912, Je	0 23.8 E	−0.7
Tabaco (*c*)	1902, My	0 52.4 E	1912, Je	0 51.6 E	−0.1
Masbate (*b*)	1902, Ap	0 53.1 E	1912, No	1 00.4 E	+0.7
Calbayog (*b*)	1902, Oc	1 05.6 E	1912, De	1 18.6 E	+1.3
Catbalogan (*b*)	1902, Se	1 22.5 E	1912, De	1 24.6 E	+0.2
Tacloban (*b*)	1901, Au, Se	0 58.4 E	1912, De	1 01.0 E	+0.2
Cuyo (*a*)	1903, Oc	1 29.5 E	1913, Ja	1 27.6 E	−0.2
Iloilo (*b*)	1901, Je	1 30.4 E	1912, Je	1 37.1 E	+0.6
Valle Hermosa (*b*)	1903, Ja	1 19.6 E	1912, Jy	1 24.7 E	+0.5
Iligan (*b*)	1902, No	1 42.7 E	1912, Au	1 50.5 E	+0.8
Misamis (*b*)	1902, Fe	1 42.6 E	1912, Au	1 52.8 E	+1.0
Surigao (*b*)	1903, Je	2 14.1 E	1912, Se	2 20.8 E	+0.7
Butuan (*c*)	1902, Je	1 29.4 E	1912, Au	1 46.7 E	+1.7
Davao (*b*)	1907, My	2 06.2 E	1912, Oc	2 14.5 E	+1.5

OBSERVATIONS AT SEA AND THEIR DISTRIBUTION.

Magnetic observations at sea were secured by the *Bache* and *Hydrographer* along the Atlantic coast and by the *Patterson, Explorer*, and *McArthur* in connection with surveying work in Alaska.

Summary of results at sea.

Steamer	General region	Results from swings			Results from course observations		
		Declination	Dip	Intensity	Declination	Dip	Intensity
Bache	Atlantic	4	0	0	0	0	0
Hydrographer	do	20	0	0	0	0	0
Explorer	Pacific	1	1	1	0	0	0
McArthur	do	7	0	0	0	0	0
Patterson	do	10	6	6	1	1	1
Total		42	7	7	1	1	1

INSTRUMENTAL CORRECTIONS.

Most of the instruments used in the field work have been compared with the standard instruments at Cheltenham during the year, the results generally differing but little from those of previous comparisons.

After comparison observations with the standard instruments at many of the principal magnetic observatories of the world, the Department of Terrestrial Magnetism of the Carnegie Institution of Washington adopted an international standard, representing approximately an average of the various instruments with which comparisons were made. The comparisons at Cheltenham showed that the standard instruments there were in practical agreement with the international standard as regards declination and dip, but that the horizontal intensity instrument gave results about 0.001H too high.

It has been decided, beginning with 1913, to reduce the results of magnetic observations made by this Bureau to the International Standard of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington. Horizontal intensity results heretofore published must be diminished by 0.001H to reduce them to that standard.

Corrections to magnetometers.

Magnetometer	Correction to east declination	Correction to H in parts of H
4	0.0	−0.0024
8	0.0	− .0015
10	0.0	.0000
11	0.0	− .0016
17	0.0	− .0010
18	0.0	+ .0006
19	0.0	− .0020
20	0.0	+ .0008
22	+0.9	+ .0006
26	0.0	− .0010
29	0.0	− .0024
30	0.0	− .0010
31	0.0	− .0020
36	−0.4	.0000
37	0.0	+ .0012
38	0.0	.0000

Corrections to dip circles.

Number	Pattern	Needles	Designation	Correction
15	Kew-Casella	5 and 6	15.56	0.0
23	Kew-Casella	2 and 2	23.22	−1.3
23*	Kew-Casella	3 and 4	23.34	+2.7*
31	Kew-Dover	1 and 2	31.12	−4.0
32	L. C.-Dover	1 and 2	32.12	+6.0
34	L. C.-Dover	5 and 6	34.56	+4.6
36	Kew-Dover	1 and 2	36.12	−1.3
5676	Kew-Casella	1 and 2	76.12	−5.0
5678	Kew-Casella	1 and 2	78.12	−3.0

* No correction has been applied to the dip results with No. 23 in the Philippine Islands.

REDUCTION OF OBSERVATIONS.

Each value of the magnetic declination has been reduced to the mean of the month in which the observation was made with the aid of the continuous observations at the nearest magnetic observatory, allowance being made for the change in diurnal range with change in magnetic latitude. No attempt has been made to correct the dip and intensity results for diurnal variation.

ARRANGEMENT OF TABLES.

LAND OBSERVATIONS.

The values of declination, dip, and horizontal intensity presented in Table I are arranged by States alphabetically, and the results for each State are given in the order of increasing latitudes. The latitudes and longitudes are in most cases the result of solar observations made with the small theodolite which forms a part of the magnetometer. In default of observations or a chart, the geographical coordinates were scaled from the best available map, either a topographic sheet of the United States Geological Survey, a post-route map, or some other State map. In such cases only the nearest whole minute of latitude or longitude is given. The horizontal intensity is expressed in terms of the one hundred-thousandth part of a C.G.S. unit of intensity of magnetic force, termed a *gamma* and designated by the Greek letter γ.

In order to include the desired amount of information in the available space the following abbreviations have been adopted. The months have been abbreviated as follows:

January	Ja	May	My	September	Se
February	Fe	June	Je	October	Oc
March	Mh	July	Jy	November	No
April	Ap	August	Au	December	De

Where the number in the magnetometer column is in italics, the declination observations were made with a compass declinometer. The letter *C* in that column indicates that the horizontal intensity was computed from observations of dip and total intensity with the dip circle and that the declination was determined with the compass attachment of the dip circle.

The observer is indicated by the initials of his name. The names of the observers are as follows:

F. L. Adams	E. D. Gordon	H. E. McComb
A. F. Beal	J. W. Green	E. Mueller
J. R. Benton	G. Hartnell	F. Neumann
P. R. Bettison	W. M. Hill	R. P. Strough
I. M. Dailey	A. Joachims	O. W. Swainson
O. H. Gaarden	J. S. S. Jones	T. Riggs, jr
A. L. Giacomini	T. J. Maher	L. W. Weed

SEA OBSERVATIONS.

The results obtained on board ship are given in Table II. The general arrangement is indicated by the headings. In general, each value is the result of observations on 8 or 16 equidistant headings, swinging ship both with port and starboard helms. Where the number of headings is only two or three the result usually depends upon observations on the ship's course and one or two points to either side. In the column headed "Sea," *sm.* means smooth; *sw.*, swell; *lt.*, light; *mod.*, moderate; *hvy.*, heavy. The commanding officers of the different ships were as follows:

Bache.....W. C. Hodgkins
Explorer.....R. S. Patton
Hydrographer.....H. C. Graves
McArthur.....C. G. Quillian
Patterson.....J. B. Miller

Intensity results are given in C. G. S. units. The horizontal intensity has been computed from the dip and total intensity.

LAND OBSERVATIONS.

TABLE I.—*Magnetic observations on land in 1913.*

ALASKA.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M	D.C.	
	° ′	° ′		*East*	° ′	γ			
Dutch Harbor	53 53.4	166 32.1	My 30	17 27.0	66 40.7	20942	18	34.56	A.J.
Do	53 53.4	166 32.1	Se 23, 24	17 25.0	66 41.0	20955	8	32.12	A.L.G.
Do	53 53.4	166 32.1	Oc 30	.. ....	66 41.9	.....	...	32.12	A.L.G.
Ukolnoi	55 12.6	161 41.2	Oc 21	16 46.9	70 32.3	*18007*	*C*	32.12	A.L.G.
Popof Island:									
Red	55 18.5	160 30.9	Jy 15	17 54.9	.. ....	.....	*742*	.....	I.M.D.
Sand Point	55 19.3	160 32.3	Je 10, 11	18 32.4	68 45.3	19584	8	32.12	A.L.G.
East Base	55 19.4	160 31.6	Jy–Au	17 29.6	.. ....	.....	*742*	.....	I.M.D.
Green	55 21.5	160 28.2	Jy 17	17 36.7	.. ....	.....	*742*	.....	I.M.D.
Beat	55 21.7	160 33.6	Jy 10	17 43.1	.. ....	.....	*742*	.....	I.M.D.
Prince of Wales Island:									
Suspire	55 27.4	133 08.5	Oc 1	30 33.0	.. ....	.....	*15*	.....	P.R.B.
Suspire, 13.8 ft. n.e.	55 27.4	133 08.5	Oc 1	29 22.0	.. ....	.....	*15*	.....	P.R.B.
Witness	55 32.9	133 13.8	Se 25	30 05.2	.. ....	.....	*15*	.....	P.R.B.
Cul	55 39.3	133 26.9	Se 23, 24	30 02.1	.. ....	.....	*15*	.....	P.R.B.
Sitka Observatory	57 03.0	135 20.1	Ja–De	30 22.1	74 28.9	15602	37	2 EI	F.L.A.
Goodnews Bay	59 03.2	161 47.8	Au 11	19 01.2	71 09.7	17587	18	34.56	A.J.
Prince William Sound:									
Chow	60 28.9	147 58.7	Je 14	28 17.7	.. ....	.....	*733*	.....	O.W.S.
First	60 34.1	148 03.4	My 24	28 01.2	.. ....	.....	*733*	.....	J.S.S.J.
Wire	60 37.2	148 08.7	My 23	27 59.5	.. ....	.....	*733*	.....	J.S.S.J.
Catch	60 40.4	148 05.7	My 23	28 10.1	.. ....	.....	*733*	.....	J.S.S.J.
141st Meridian Boundary:									
Mon't 187	61 37.2	141 00.0	Au 19	31 33	.. ....	.....	744	.....	T.R.
177	61 57.9	141 00.0	Au 15	30 54	.. ....	.....	744	.....	T.R.
166	62 28.3	141 00.0	Au 7	32 51	.. ....	.....	744	.....	T.R.
163	62 35.2	141 00.0	Au 5	32 51	.. ....	.....	744	.....	T.R.
147	63 16.1	141 00.0	Jy 27	33 56	.. ....	.....	744	.....	T.R.
126A	64 04.3	141 00.0	Jy 17	34 25	.. ....	.....	744	.....	T.R.
121	64 18.9	141 00.0	Jy 10	34 37	.. ....	.....	744	.....	T.R.
114A	64 36.4	141 00.0	Je 30	34 55	.. ....	.....	744	.....	T.R.
112	64 40.9	141 00.0	Je 29	35 07	.. ....	.....	744	.....	T.R.

ARIZONA.

				East					
Tucson Observatory	32 14.8	110 50.1	Ja–De	13 37.0	59 21.7	27243	30	3 EI	A.F.B.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

ARKANSAS.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments M	Instruments D.C.	Observer
	° ′	° ′		*East.*	° ′	γ			
Lonoke	34 48	91 55	De 10	6 34.6	65 17.2	24081	20	31.12	W.M.H.
Conway	35 06	92 27	De 6, 7	6 49.8	65 44.9	23867	20	31.12	W.M.H.
Morrillton	35 09	92 44	No 30, 31	6 46.2	65 46.4	23799	20	31.12	W.M.H.
Charleston	35 18	94 01	No 13, 14	7 58.8	65 45.6	23787	20	31.12	W.M.H.
Paris	35 18.4	93 40.3	No 18, 19	7 45.2	65 49.3	23819	20	31.12	W.M.H.
Fort Smith	35 23	94 25	No 11, 12	8 13.8	65 54.0	23742	20	31.12	W.M.H.
Ozark	35 29	93 48.8	No 23	8 08.4	65 57.9	23674	20	31.12	W.M.H.
Ozark, N. M.	35 29	93 48.8	No 26	8 04.5	.. ....	.....	20	.....	W.M.H.
Fayetteville	36 04	94 10	No 1	7 49.6	66 24.0	23257	20	31.12	W.M.H.
Huntsville	36 05	93 44	No 6, 7	7 44.3	66 30.9	23179	20	31.12	W.M.H.

COLORADO.

				East.					
Durango	37 16.7	107 52.9	Jy 28	14 35.3	64 53.7	24043	29	78.12	H.E.M.
Alamosa	37 28.2	105 52.2	Jy 25	13 39.8	65 26.2	24004	29	78.12	H.E.M.
Silverton	37 49.0	107 39.9	Jy 29	15 21.2	65 46.9	23531	29	78.12	H.E.M.
Creede	37 51	106 58.5	Jy 26	16 07.0	65 41.1	23530	29	78.12	H.E.M.
Telluride	37 56	107 48.8	Au 2	15 03.2	65 34.7	23567	29	78.12	H.E.M.
Ouray	38 01.2	107 41.0	Au 6	15 16.8	65 19.5	23800	29	78.12	H.E.M.
Saguache	38 05.1	106 07.7	Jy 23	14 39.6	66 05.0	23463	29	78.12	H.E.M.
Westcliffe	38 08.8	105 27.8	Jy 8	15 22.4	66 31.9	23170	29	78.12	H.E.M.
Ridgeway	38 09.6	107 43.2	Au 4	14 53.2	65 48.9	23400	29	78.12	H.E.M.
Salida	38 33.4	106 00.0	Jy 10	14 50.5	66 14.6	23248	29	78.12	H.E.M.
Cripple Creek	38 44.7	105 11.5	Jy 1	14 11.4	67 34.9	22233	29	78.12	H.E.M.
Lake George	38 58.0	105 20.7	Jy 4	13 59.2	67 07.8	22336	29	78.12	H.E.M.
Grand Junction	39 04.8	108 33.2	Au 8	15 35.4	66 30.3	22924	29	78.12	H.E.M.
Fairplay	39 13	105 58.1	Jy 16	14 29.6	67 04.0	22545	29	78.12	H.E.M.
Leadville	39 15.2	106 17.7	Jy 11	14 42.6	66 57.9	22661	29	78.12	H.E.M.
Breckenridge	39 29	106 01.8	Jy 15	14 44.2	67 03.3	22739	29	78.12	H.E.M.
Golden	39 45.4	105 12.0	Je 25	14 45.4	67 35.2	22327	29	78.12	H.E.M.
Central City	39 47.9	105 31.8	Je 27	14 27.0	67 30.1	22572	29	78.12	H.E.M.
Greeley	40 26.0	104 41.0	Je 23	14 25.6	68 27.9	21700	29	78.12	H.E.M.

CONNECTICUT.

				West.					
Unionville	41 46.0	72 52.9	Au 14	12 15.3	72 47.3	17655	11	36.12	L.W.W.
Simsbury	41 52.6	72 48.0	Au 12	12 04.0	72 47.7	17474	11	36.12	L.W.W.
New Hartford	41 53.0	72 58.9	Au 16	11 40.0	72 48.0	17536	11	36.12	L.W.W.
Norfolk	42 00.0	73 11.4	Au 19	11 14.4	73 00.7	17434	11	36.12	L.W.W.
Canaan	42 00.7	73 19.2	Au 20	11 49.3	73 12.2	17330	11	36.12	L.W.W.

DELAWARE.

				West.					
Felton	38 59.7	75 35.1	Jy 9	7 03.0	70 43.9	19339	17	76.12	J.R.B.
Greenville	39. 46.4	75 35.5	Jy 29	9 50.7	71 01.9	19771	17	76.1	J.R.B.
Cliffs	39 46.8	75 31.6	Jy 24	8 23.6	71 12.2	19380	17	76.1	J.R.B.
Concord	39 46.8	75 32.6	Jy 23	3 41.0	73 25.2	17697	17	76.1	J.R.B.
Bellevue	39 46.8	75 28.5	Jy 11	12 09.8	71 22.2	19255	17	76.12	J.R.B.
Henry Clay Factory	39 47.0	75 33.3	Jy 25	10 15.5	71 43.3	18986	17	76.1	J.R.B.
Hockessin 2	39 47.2	75 40.8	Jy 30	4 34.7	72 18.8	20140	17	76.1	J.R.B.
Montchanin 2	39 47.3	75 36.7	Jy 26	3 16.0	71 15.2	18676	17	76.1	J.R.B.
Mount Cuba	39 47.4	75 38.2	Jy 30	5 47.6	71 39.5	18322	17	76.1	J.R.B.
Ashland	39 47.5	75 39.1	Jy 30	5 40.5	72 04.6	17969	17	76.1	J.R.B.
Rockland 2	39 47.6	75 34.3	Jy 26	6 49.0	71 58.4	18267	17	76.1	J.R.B.
Rockland 1	39 47.6	75 32.8	Jy 22	8 56.0	71 13.0	19274	17	76.12	J.R.B.
Montchanin 1	39 47.6	75 35.4	Jy 17	10 10.0	71 35.1	18674	17	76.12	J.R.B.
Silverside	39 47.6	75 29.3	Jy 14	12 09.6	71 11.5	19437	17	76.12	J.R.B.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

DELAWARE—Continued.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M	D.C.	
	° ′	° ′		*West.*	° ′	γ			
Talleys Corner	39 47.7	75 31.6	Jy 24	10 33.1	70 55.5	19576	17	76.1	J.R.B.
Hockessin 1	39 47.7	75 42.8	Jy 30	6 47.9	71 26.2	18744	17	76.1	J.R.B.
Guyencourt	39 48.6	75 35.1	Jy 29	8 41.2	71 08.5	19011	17	76.1	J.R.B.
Claymont	39 48.6	75 26.2	Jy 15	9 51.0	71 13.3	19089	17	76.12	J.R.B.
Carpenter	39 49.2	75 28.7	Jy 21	8 17.7	71 42.4	18409	17	76.12	J.R.B.
Brandywine	39 49.6	75 32.6	Jy 19	7 17.7	71 43.7	18459	17	76.12	J.R.B.
Granogue	39 49.7	75 35.7	Au 2	4 39.0	72 23.4	17821	17	76.1	J.R.B.

HAWAII.

				East.					
Ka Lae	18 53.9	155 41.3	Au 29	10 11.6	37 09.1	30199	19	23.34	J.W.G.
Kilauea H	19 23.9	155 17.3	Oc 27	9 30.3	38 02.9	29021	19	23.22	J.W.G.
Kilauea G	19 24.0	155 16.4	Oc 24	12 40.4	39 01.9	28072	19	23.22	J.W.G.
Halemaumau:									
South	19 24.4	155 17.1	Oc 15	15 02	.. ....	.....	19	.....	J.W.G.
C	19 24.5	155 17.1	Se 9	13 03.6	35 09.2	29221	19	23.34	J.W.G.
C2	19 24.5	155 17.1	Se 13–19	9 49.0	35 03.1	31207	19	23.34	J.W.G.
D	19 24.5	155 17.0	Se 23	9 44.6	35 45.4	30792	19	23.34	J.W.G.
G	19 24.5	155 17.2	Oc 10	7 15.7	36 29.2	29907	19	23.22	J.W.G.
Southeast	19 24.5	155 17.1	Oc 15	16 20	.. ....	.....	19	.....	J.W.G.
Southwest	19 24.5	155 17.2	Oc 24	3 45	.. ....	.....	19	.....	J.W.G.
West	19 24.6	155 17.3	Oc 24	0 17	.. ....	.....	19	.....	J.W.G.
East	19 24.6	155 17.1	Oc 15	14 11	.. ....	.....	19	.....	J.W.G.
H	19 24.6	155 17.0	Oc 11	10 14.7	36 52.7	30051	19	23.22	J.W.G.
Kilauea F	19 24.6	155 15.7	Oc 23	15 05.8	41 17.9	28091	19	23.22	J.W.G.
Halemaumau:									
North	19 24.7	155 17.1	Oc 15	8 48	.. ....	.....	19	.....	J.W.G.
Northwest	19 24.7	155 17.2	Oc 15	10 37	.. ....	.....	19	.....	J.W.G.
A	19 24.7	155 17.2	Se 5, 11	13 12.4	41 36.1	28238	19	23.34	J.W.G.
A2	19 24.7	155 17.2	Se 15, 18	13 13.4	37 01.3	28299	19	23.34	J.W.G.
B	19 24.7	155 17.1	Se 5–22	7 39.3	39 47.6	27710	19	23.34	J.W.G.
E	19 24.7	155 17.0	Se 24	11 57.5	36 44.5	30890	19	23.34	J.W.G.
F	19 24.8	155 17.2	Oc 14	8 50.8	35 25.7	28619	19	23.22	J.W.G.
Kilauea C	19 25.0	155 17.4	Oc 18	11 39.1	41 18.6	29780	19	23.22	J.W.G.
Kilauea E	19 25.4	155 15.4	Oc 22	11 14.7	41 48.6	30692	19	23.22	J.W.G.
Kilauea B	19 25.4	155 17.4	Oc 17	11 47.4	39 22.9	29644	19	23.22	J.W.G.
Kilauea	19 25.9	155 15.7	Au 27	10 08.8	36 30.5	30687	19	23.34	J.W.G.
Do	19 25.9	155 15.7	Se 27	10 08.7	36 26.1	30688	19	23.22	J.W.G.
Do	19 25.9	155 15.7	Oc 7	.. ....	36 32.5	30654	19	23.22	J.W.G.
Kilauea D	19 26.0	155 16.4	Oc 20	9 18.0	42 56.6	28870	19	23.22	J.W.G.
Mauna Loa F	19 27.6	155 35.8	Oc 3	.. ....	38 22.1	26964	..	23.22	J.W.G.
Mauna Loa E	19 27.7	155 35.6	Oc 2	.. ....	39 27.5	27878	..	23.22	J.W.G.
Mauna Loa A	19 28.0	155 35.3	Se–Oc	15 43	38 16.3	28776	*C*	23.22	J.W.G.
Mauna Loa B	19 28.2	155 35.1	Oc 1	.. ....	37 44.0	29379	..	23.22	J.W.G.
Mauna Loa C	19 28.4	155 35.0	Oc 1	.. ....	38 00.1	29830	..	23.22	J.W.G.
Mauna Loa D	19 28.6	155 34.9	Oc 2	.. ....	38 07.8	29082	..	23.22	J.W.G.
Kapoho	19 29.8	154 48	Au 25	9 48.4	37 57.3	31260	19	23.34	J.W.G.
Hilo, Mooheau Park	19 43.6	155 05.1	Au 23	9 04.4	37 06.7	30130	19	23.34	J.W.G.
Hilo, Cocoanut Island	19 44.0	155 04.2	Au 22	9 07.9	37 43.2	29895	19	23.34	J.W.G.
Lahaina	20 52.4	156 40.9	Au 19	9 35.7	37 54.5	29718	19	23.34	J.W.G.
Honolulu Observatory	21 19.2	158 03.8	Ja–De	9 37.3	39 33.5	29073	36	4EI	J.W.G.
Do	21 19.2	158 03.8	Jy 18–26	9 37.6	39 32.6	29072	19	23.34	J.W.G.
Robinson	21 28.1	158 01.8	No 3	11 18.6	38 19.7	29353	19	23.22	J.W.G.
Port Allen	21 53.8	159 36.5	Au 14	12 41.8	39 32.7	29000	19	23.34	J.W.G.
Waimea	21 57.0	159 42.0	Au 13	10 18.1	38 42.5	29146	19	23.34	J.W.G.

IDAHO.

				East.					
Idaho Falls	43 29.5	112 01.1	Au 28	18 26.0	70 07.3	20179	29	78.12	H.E.M.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

MARYLAND.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M	D C.	
	° ′	° ′		*West.*	° ′	γ			
Cheltenham Obs'y	38 44.0	76 50.5	Ja–De	5 54.5	70 41.0	19600	26	26EI	G.H.
Do	.. ....	....	Ja 11	.. ....	70 41.3	.....	..	15.56	O.H.G.
Do	.. ....	....	Ja 20–28	5 51.5	70 40.9	19631	17	76.12	O.H.G.
Do	.. ....	....	Mh 24, 25	5 53.8	.. ....	19601	4	.....	G.H.
Do	.. ....	....	My 12–15	5 53.4	.. ....	19610	38	.....	G.H.
Do	.. ....	....	Au 26, 27	.. ....	70 41.8	19585	17	76.12	G.H.
Do	.. ....	....	No 6, 7	5 57.7	70 43.7	19557	29	78.12	G.H.
Do	.. ....	....	De 13–30	.. ....	70 42.9	19565	22	22EI	G.H.

MASSACHUSETTS.

				West.					
Palmer	42 08.7	72 20.6	Au 4, 5	10 25.4	73 28.7	16931	11	36.12	L.W.W.
Worcester	42 16.7	71 48.5	Jy 31	13 00.6	73 28.1	17085	11	36.12	L.W.W.
Gilbertville	42 17.9	72 14.3	Au 6	12 26.6	73 15.3	17112	11	36.12	L.W.W.
Northampton	42 20.0	72 39	Au 9	12 12.1	73 16.1	17111	11	36.12	L.W.W.
Boston, Castle Island	42 20.2	71 00.7	Je 20	13 47.4	.. ....	17198	11	.....	L.W.W.
Wakefield	42 30.4	71 04.0	Je 24	13 22.1	73 42.4	16580	11	15.56	L.W.W.
Fitchburg	42 33.6	71 48	Jy 29	12 59.1	73 26.7	16895	11	36.12	L.W.W.
Middleton	42 35.5	71 00.2	Je 27	12 13.5	73 51.4	16555	11	15.56	L.W.W.
Winchendon	42 41.0	72 04.1	Jy 23	12 52.4	73 33.7	16836	11	36.12	L.W.W.
Georgetown	42 43.2	71 00.4	Je 30	13 19.6	73 49.2	16544	11	15.56	L.W.W.

MICHIGAN.

Centerville	41 55.3	85 31	Je 30	0 07.4E	72 50.1	18012	20	31.12	W.M.H.
Athens	42 05.9	85 15	Jy 3, 5	0 01.2W	73 00.7	17832	20	31.12	W.M.H.
Kalamazoo	42 17.5	85 37.0	Jy 10, 11	1 05.4E	73 13.6	17710	20	31.12	W.M.H.
Battle Creek	42 20.2	85 10.7	Jy 8	0 26.2W	73 10.8	17787	20	31.12	W.M.H.
Battle Creek A	42 20.2	85 10.7	Jy 9	0 22.6W	.. ....	.....	20	.....	W.M.H.
Mason	42 34.6	84 26	Je 26	0 45.7W	73 27.2	17405	20	31.12	W.M.H.
Wayland	42 41.5	85 38	Jy 14	0 09.6E	73 22.8	17500	20	31.12	W.M.H.
Wayland, N. M	42 41.5	85 38	Jy 15	0 07.7E	.. ....	.....	20	.....	W.M.H.
Caledonia	42 47.8	85 30	Jy 18	0 30.8E	73 27.3	17464	20	31.12	W.M.H.
Lowell	42 57	85 20.6	Jy 21, 22	0 04.5W	73 36.0	17336	20	31.12	W.M.H.
Ludington	43 58	86 26	Jy 24, 25	1 11.0E	74 28.8	16529	20	31.12	W.M.H.

MINNESOTA.

				East.					
Bethel	45 24	93 15	Oc 16, 17	8 42.5	74 52.0	16115	20	31.12	W.M.H.
Zimmerman	45 27	93 35	Oc 20, 21	7 53.8	74 59.5	16052	20	31.12	W.M.H.
North Branch	45 31.2	92 56.3	Oc 13, 14	10 15.2	74 56.8	16153	20	31.12	W.M.H.
Rush City	45 41.0	92 58.8	Oc 9–12	10 26.8	75 02.1	16071	20	31.12	W.M.H.

MISSOURI.

				East.					
Kansas City, new	39 00.9	94 33	Oc 28–30	9 14.6	69 09.7	21389	20	31.12	W.M.H.
Kansas City, old	39 05.6	94 32.9	Oc 24, 25	9 19.7	69 20.2	.....	20	31.12	W.M.H.

MONTANA.

				East.					
Butte	46 00.3	112 31.6	Au 30	22 09.1	71 47.0	18677	29	78.12	H.E.M.
Helena	46 37.1	112 00.8	Se 2	20 09.4	72 07.4	18363	29	78.12	H.E.M.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

NEBRASKA.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments M	Instruments D.C.	Observer
	° ′	° ′		*East.*	′	γ			
Beaver City	40 08	99 47.8	Je 17	11 39.3	69 20.8	21073	29	78.12	H.E.M.
Trenton	40 10.2	101 00.9	Je 20	12 48.4	68 59.6	21401	29	78.12	H.E.M.
Lincoln	40 49.5	96 40.8	Je 13	10 00.4	70 39.0	20059	29	78.12	H.E.M.

NEW HAMPSHIRE.

				West.					
Milford	42 50.1	71 38.7	Jy 16, 17	13 44.4	73 37.2	16715	11	15.56	L.W.W.
Peterboro	42 52.8	71 56.3	Jy 21	13 03.4	73 41.1	16708	11	36.12	L.W.W.
Exeter	42 58.3	70 57.4	Jy 2	13 15.4	73 38.3	16696	11	15.56	L.W.W.
Auburn	42 59.8	71 20.5	Jy 10	14 21.1	73 32.7	16927	11	15.56	L.W.W.
Manchester	43 00.0	71 25.5	Jy 12	13 54.3	73 48.4	16666	11	15.56	L.W.W.
Dover	43 11.8	70 51.5	Jy 8	14 19.0	73 49.7	16641	11	15.56	L.W.W.

NEW JERSEY.

				West.					
Pennsgrove 1	39 41.5	75 28.1	Au 5	8 38.6	70 57.2	19124	17	76.1	J.R.B.
Pennsgrove 2	39 42.9	75 28.2	Au 5	8 58.4	71 08.2	19236	17	76.1	J.R.B.
Dolbows Landing	39 45 5	75 27.7	Au 4	9 01.0	71 15.7	19100	17	76.1	J.R.B.
Nortonville	39 47.7	75 23.9	Au 6	8 37.3	70 59.9	19238	17	76.1	J.R.B.
Repaupo	39 48.4	75 18.4	Au 6	7 48.5	71 27.9	18801	17	76.1	J.R.B.
Haddonfield	39 54.2	75 01.3	Au 7, 8	7 49.4	71 18.4	18849	17	76.12	J.R.B.
Merchantville	39 58.2	75 01.5	Au 9	7 48.4	71 24.6	18852	17	76.12	J.R.B.
Beverly	40 02.5	74 54.0	Au 11, 12	8 16.9	71 21.9	18803	17	76.12	J.R.B.

NEW YORK.

				West.					
Whitehall	43 32.8	73 26.1	Au–Se	12 29.5	74 13.8	16228	11	36.12	L.W.W.
Port Henry	44 02.2	73 27.5	Se 6	14 26.2	74 25.1	16150	11	36.12	L.W.W.
Mineville	44 04.0	73 29.8	Se 5	14 26.9	74 35.1	15898	11	36.12	L.W.W.
Plattsburg	44 40.8	73 26.7	Se 8	12 37.2	74 04.1	16678	11	36.12	L.W.W.
Morrisonville	44 42.6	73 34.7	Se 9, 10	11 17.2	74 34.7	16084	11	36.12	L.W.W.
Ogdensburg	44 43.7	74 32.9	Se 29	13 22.7	74 57.0	15724	11	36.12	L.W.W.
North Lawrence	44 49.3	74 39.8	Se 23	13 13.3	75 03.0	15470	11	36.12	L.W.W.
Brushton	44 49.6	74 31.4	Se 19	11 38.5	74 51.2	15726	11	36.12	L.W.W.
Burke	44 55.2	74 09.3	Se 12	11 51.2	74 49.5	16141	11	36.12	L.W.W.

NORTH CAROLINA.

				West.					
Raleigh	35 47.3	78 40.6	Je 17, 18	2 48.0	67 54.7	21755	17	76.12	J.R.B.
Wake Forest	35 56.4	78 31.1	Je 19, 20	3 22.4	67 54.5	21674	17	76.12	J.R.B.
Franklinton	36 06.9	78 27.2	Je 21	2 59 5	68 18.8	21359	17	76.12	J.R.B.
Whitakers	36 06.9	77 44.2	Je 25, 26	2 57 8	68 13.5	21407	17	76.12	J.R.B.
Scotland Neck	36 07.7	77 24.7	Jy 1, 2	4 18.4	68 04.8	21480	17	76.12	J.R.B.
Enfield	36 11.6	77 39.7	Je 27	3 49 5	68 21.6	21228	17	76.12	J.R.B.
Littleton	36 25.4	77 55.6	Je 24	4 18.3	68 24.1	21237	17	76.12	J.R.B.

OHIO.

				West.					
Alliance	40 54.8	81 10.8	Je 16, 17	3 26.2	72 25.4	18223	20	31.12	W.M.H.
Lodi	41 03.4	82 04.3	Je 19, 20	3 05.1	72 25.7	18214	20	31.12	W.M.H.
Toledo	41 41.7	83 26.5	Je 23	1 26.6	72 52.0	17862	20	31.12	W.M.H.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

PENNSYLVANIA.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments M	Instruments D.C.	Observer
	° ′	° ′		*West.*	° ′	γ			
Cossart	39 51.0	75 35.9	Au 2	7 36.8	71 19.9	18905	17	76.1	J.R.B.
Chadds Ford Junction	39 52.4	75 35.6	Au 2	8 14.7	71 08.2	19058	17	76.1	J.R.B.
Franklin	41 24.4	79 50.5	Je 4	4 47.5	72 51.0	17906	20	31.12	W.M.H.
Tunkhannock, old	41 32.0	75 55.4	My 16	8 44.9	72 45.1	17748	20	31.12	W.M.H.
Tunkhannock, new	41 33.5	75 56.4	My 21, 22	8 43.2	72 44.9	17750	20	31.12	W.M.H.
Meadville, old	41 36.8	80 09.3	Je 6, 7	4 29.4	72 53.6	17799	20	31.12	W.M.H.
Titusville	41 38.4	79 42.5	My–Je	4 58.8	72 59.5	17652	20	31.12	W.M.H.
Meadville, new	41 39.8	80 09.7	Je 10	4 48.3	72 54.3	17809	20	31.12	W.M.H.
Albion	41 54.3	80 18.6	Je 13, 14	4 28.3	73 06.0	17560	20	31.12	W.M.H.
Corry	41 57	79 37.7	My 28, 29	4 39.8	73 08.1	17464	20	31.12	W.M.H.

PHILIPPINE ISLANDS.

		East.	1912.*	*East.*					
Davao	7 04.5	125 36.1	Oc 2	2 14.5	.. ....	38382	19	.....	W.M.H.
Misamis, old	8 08.5	123 50.7	Au 15, 16	1 52.8	1 49.0	38785	19	23.34	W.M.H.
Misamis, new	8 09.2	123 51.1	Au 12, 13	1 49.0	1 48.9	38784	19	23.34	W.M.H.
Iligan, new	8 13.7	124 14.2	Au 20, 22	1 49.9	2 21.8	38602	19	23.34	W.M.H.
Iligan, old	8 14.1	124 13.8	Au 24	1 50.5	2 21.5	38609	19	23.34	W.M.H.
Butuan	8 57.0	125 32.5	Au 28, 29	1 46.7	4 08.6	38314	19	23.34	W.M.H.
Puerto Princesa	9 44.3	118 42.7	*Fe 7, 8	1 34.9	4 43.7	38970	19	23.34	W.M.H.
Surigao	9 47.6	125 29.3	Se 9, 10	2 20.8	5 08.0	38122	19	23.34	W.M.H.
Cebu	10 17.6	123 54.3	Au 5–7	1 33.0	6 40.4	38235	19	23.34	W.M.H.
Valle Hermosa	10 20.1	123 19.4	Jy 24, 25	1 24.7	6 47.3	38437	19	23.34	W.M.H.
Dalan, Dalanganem Island	10 39.4	120 14.7	Oct. 14	1 32.0	.. ....	.....	735	.....	E.M.
Iloilo, old	10 41.6	122 34.2	Je 25	1 37.1	7 27.8	38211	19	23.34	W.M.H.
Iloilo, new	10 41.7	122 35.1	Je 26, 27	1 49.8	7 35.5	38020	19	23.34	W.M.H.
San Jose de Buena Vista	10 44.3	121 56.0	Jy 2, 3	1 39.0	7 21.4	38525	19	23.34	W.M.H.
Cuyo, new	10 51.3	121 00.2	*Ja 17, 18	1 22.2	7 43.6	38772	19	23.34	W.M.H.
Cuyo, old	10 51.4	121 00.4	*Ja 15	1 27.6	7 42.7	38838	19	23.34	W.M.H.
Tagauayan Bay	10 57.5	121 13.6	*Au 17	1 29.5	.. ....	.....	1	.....	T.J.M.
Tacloban	11 14.3	125 00.0	De 13, 14	1 01.0	.. ....	38206	19	.....	W.M.H.
Seco Island	11 19.1	121 40.2	*Se 25	1 25.9	.. ....	.....	1	.....	T.J.M.
Batbatan Island	11 28.2	121 54.2	*Se 26	1 14.0	.. ....	.....	1	.....	T.J.M.
Red, Calumbagan Island	11 41.3	120 08.5	De 19	1 22.4	.. ....	.....	735	.....	R.P.S.
Catbalogan	11 46.6	124 52.7	De 23, 24	1 24.6	10 23.6	38149	19	23.34	W.M.H.
Calis, Coron Island	11 48.6	120 15.5	Jy 13	1 26.1	.. ....	.....	735	.....	R.P.S.
Uson, Busuanga Island	11 59.3	120 10.8	*No 24	1 16.9	.. ....	.....	1	.....	E.D.G.
Baquit, Baquit Island	12 01.2	120 08.8	De 19	1 19.2	.. ....	.....	735	.....	R.P.S.
Dinaran, Dinaran Island	12 02.1	120 21.3	De 20	1 15.8	.. ....	.....	735	.....	E.M.
Calbayog, new	12 03.7	124 36.5	De 4, 5	0 43.9	11 10.1	38361	19	23.34	W.M.H.
Calbayog, old	12 04.1	124 35.6	No–De	1 18.6	11 06.5	38413	19	23.34	W.M.H.
Nanga Island	12 20.5	120 16.2	*De 1	1 15.6	.. ....	.....	1	.....	T.J.M.
Masbate	12 22.5	123 37.0	No 23, 25	1 00.4	12 04.5	37947	19	23.34	W.M.H.
Romblon, new	12 34.7	122 16.1	No 9, 11	1 02.7	11 27.8	38443	19	23.34	W.M.H.
Romblon, old	12 34.7	122 16.1	No 11	1 06.3	.. ....	.....	19	.....	W.M.H.
Bajo, Cayos del Bajo	12 42.0	120 28.9	Se 26	1 10.1	.. ....	.....	735	.....	E.M.
Albay	13 08.5	123 44.2	Je 4, 5	0 32.5	12 31.9	38301	19	23.34	W.M.H.
Legaspi	13 09.2	123 45.4	Je 7, 8	0 23.8	12 44.8	37947	19	23.34	W.M.H.
Tabaco	13 21.8	123 43.8	Je 13, 14	0 51.6	12 59.2	38004	19	23.34	W.M.H.
Calapan	13 25.0	121 10.7	No 16, 18	1 10.2	13 52.9	38329	19	23.34	W.M.H.
Boac	13 26.2	121 48.8	Oc 21	0 58.2	13 28.5	38100	19	23.34	W.M.H.
Batangas	13 45.4	121 03.2	My 25, 26	0 50.4	13 52.0	38344	19	23.34	W.M.H.
Lucena	13 55.8	121 36.5	Oc 28, 29	0 53.2	14 07.9	38479	19	23.34	W.M.H.
Atimonan	14 00.0	121 54.9	No 4, 5	0 42.5	14 23.4	37705	19	23.34	W.M.H.
Manila	14 34.4	120 58.6	Mh 29, 30	0 50.4	15 34.4	38311	19	23.34	W.M.H.
Antipolo, Obs'y	14 35.8	121 10.0	Mh 25–27	0 39.4	16 14.4	38254	19	23.34	W.M.H.
Do	14 35.8	121 10.0	*Fe 18, 19	0 39.0	16 16.1	38235	19	23.34	W.M.H.
San Fernando	15 01.2	120 41.0	My 10, 13	0 54.6	16 32.0	38241	19	23.34	W.M.H.
San Isidro	15 18.5	120 54.0	My 20, 21	0 47.4	16 55.8	38107	19	23.34	W.M.H.
Tarlac	15 28.8	120 35.7	My 15	0 40.3	17 29.4	38061	19	23.34	W.M.H.
Vigan	17 33.6	120 24.0	Ap 9	0 19.2	21 48.5	37590	19	23.34	W.M.H.
Tuguegarao	17 36.9	121 43.7	Ap 18	0 07.0	22 01.5	37449	19	23.34	W.M.H.
Aparri	18 21.3	121 37.8	Ap 25, 26	0 05.2	23 21.4	37422	19	23.34	W.M.H.

* All these observations were made in 1912 except those marked with an asterisk, which were in 1913.

TABLE I.—*Magnetic observations on land in 1913*—Continued.

PORTO RICO.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Instruments		Observer
							M	D.C.	
	° ′	° ′		*West.*	° ′	γ			
Porto Rico Obs'y	18 08.8	65 26.9	Ja–De	2 49.7	50 21.3	28520	31	1EI	F.N.

UTAH.

				East.					
Green River	38 59.3	110 09.9	Au 10	16 09.2	66 10.1	23212	29	78.12	H.E.M.
Provo	40 13.8	111 40.0	Au 12	17 14.6	66 42.3	22739	29	78.12	H.E.M.
Heber	40 30.2	111 24.0	Au 14	17 13.0	66 59.8	22563	29	78.12	H.E.M.
Morgan	41 02.2	111 38.4	Au 20	17 41.3	67 23.9	22296	29	78.12	H.E.M.
Ogden	41 13.1	111 59.9	Au 19	18 09.6	67 28.9	22173	29	78.12	H.E.M.
Brigham	41 31.2	112 01.2	Au 23	18 13.2	67 53.9	21863	29	78.12	H.E.M.
Logan	41 43.3	111 49.7	Au 26	18 09.0	68 02.2	21750	29	78.12	H.E.M.
Coalville	40 55.4	111 24.3	Au 21	17 40.4	67 17.6	22427	29	78.12	H.E.M.

VERMONT.

				West.					
Wilmington	42 51.8	72 51.4	Au 22	11 52.6	73 34.7	16901	11	36.12	L.W.W.
Bennington	42 53.8	73 12.0	Au 26	12 15.3	73 54.6	16581	11	36.12	L.W.W.
Rutland	43 37.1	72 57.7	Au 28	13 10.1	74 09.2	16396	11	36.12	L.W.W.

VIRGINIA.

				West.					
Cape Charles	37 16.3	76 00.7	Jy 5, 7	5 17.8	69 17.6	20463	17	76.12	J.R.B.

WASHINGTON.

				East.					
Seattle	47 39.6	122 18.3	Ap 11	23 44.4	70 43.4	19308	18	34.56	A.J.
Do	47 39.6	122 18.3	My 13, 15	23 44.4	70 47.9	19310	8	32.12	A.L.G.

WISCONSIN.

				East.					
Appleton	44 15.8	88 26.4	Au 11, 12	2 29.3	74 44.6	16292	20	31.12	W.M.H.
Green Bay	44 28.3	88 00.1	Au 1	3 14.8	74 49.6	16301	20	31.12	W.M.H.
Black Creek	44 29.5	88 27	Au 8	2 49.8	74 56.5	16011	20	31.12	W.M.H.
Seymour	44 30.8	88 21.3	Jy 28	4 20.3	75 15.5	15893	20	31.12	W.M.H.
Storm's Farm	44 32	88 20	Au 5, 6	3 55.9	75 09.2	15914	20	31.12	W.M.H.
Clintonville	44 38.0	88 43.8	Au 15	3 25.4	75 02.7	15935	20	31.12	W.M.H.
Ladysmith	45 27.9	91 05.3	Se 10, 11	4 20.8	75 02.4	16092	20	31.12	W.M.H.
Ladysmith, A	45 27.7	91 05.3	Se 12	4 21.0	.. ....	.....	20	.....	W.M.H.
Tomahawk	45 29.0	89 44	Au 19	3 42.2	75 14.8	15763	20	31.12	W.M.H.
Balsam Lake	45 29.4	92 27	Se 30	5 04.0	74 57.9	16352	20	31.12	W.M.H.
Ingram	45 31.4	90 46.6	Se 9	5 24.1	75 15.6	15914	20	31.12	W.M.H.
Rice Lake	45 31.5	91 52	Se 13, 15	5 12.5	75 17.5	15743	20	31.12	W.M.H.
Cumberland	45 33.1	92 01	Se 25, 26	5 41.2	75 10.7	15939	20	31.12	W.M.H.
Frederick	45 39.8	92 28.6	Oc 4, 5	5 29.5	75 07.7	16594	20	31.12	W.M.H.
Birchwood	45 39.8	91 33	Se 18–20	5 44.4	75 27.1	15592	20	31.12	W.M.H.
Park Falls	45 56.2	90 25.7	Se 6	3 58.0	75 27.9	15646	20	31.12	W.M.H.
Mellen	46 19.8	90 40	Au 30, 31	6 46.4	76 19.0	14564	20	31.12	W.M.H.
Von Buskirk	46 24	90 08	Au 26	2 32.6	75 37.8	15556	20	31.12	W.M.H.
Hurley	46 29.6	90 12	Au 23, 24	2 12.4	75 49.3	15665	20	31.12	W.M.H.
Saxon	46 30.7	90 24	Au 28, 29	1 01.7	75 57.3	15056	20	31.12	W.M.H.

SEA OBSERVATIONS.

TABLE II.—*Magnetic observations at sea in 1913.*

ATLANTIC OCEAN.

Station	Latitude	Longitude	Date	Declination	Dip	Horizontal intensity	Total intensity	Ship	Headings	Sea
	° ′	° ′		*East.*						
At sea	31 40	80 59	Ja 29	0 35	.....	.....	.....	Bache	16	Lt. sw.
Do	31 42	81 08	Ja 30	0 29	.....	.....	.....	do	8	Sm.
				West.						
Do	32 46	79 53	My 3	1 05	.....	.....	.....	do	16	Sm.
Do	37 06	76 06	Au 16	5 29	.....	.....	.....	do	16	Sm.
Do	39 05	74 41	Jy 24	7 20	.....	.....	.....	Hydrographer	16	Lt. sw.
Do	39 23	76 06	Jy 21	5 32	.....	.....	.....	do	16	Sm.
Do	40 53	73 40	Se 3	10 46	.....	.....	.....	do	16	Sm.
Do	40 54	73 44	Se 27	10 27	.....	.....	.....	do	16	Choppy.
Do	40 57	73 26	Se 25	10 46	.....	.....	.....	do	16	Sm.
Do	41 02	73 21	Se 26	10 49	.....	.....	.....	do	16	Choppy.
Do	41 06	73 19	Se 24	10 46	.....	.....	.....	do	16	Sm.
Do	41 06	73 17	Se 23	11 11	.....	.....	.....	do	16	Sm.
Do	41 09	72 12	Au 25	12 08	.....	.....	.....	do	16	Sm.
Do	41 13	72 54	Se 16	10 14	.....	.....	.....	do	16	Choppy.
Do	41 13	71 36	Au 15	11 46	.....	.....	.....	do	16	Choppy.
Do	41 13	73 57	Oc 10	10 54	.....	.....	.....	do	16	Sm.
Do	41 14	72 02	Au 20	11 46	.....	.....	.....	do	16	Hvy sw.
Do	41 14	72 50	Se 9	11 22	.....	.....	.....	do	16	Sm.
Do	41 14	72 50	Se 10	10 57	.....	.....	.....	do	16	Sm.
Do	41 14	72 40	Se 11	9 46	.....	.....	.....	do	16	Sm.
Do	41 18	72 05	Au 25	12 00	.....	.....	.....	do	16	Lt. sw.
Do	41 18	71 49	Au 10	12 03	.....	.....	.....	do	16	Lt. sw.
Do	41 18	72 03	Au 8	11 51	.....	.....	.....	do	16	Sm.
Do	41 20	71 32	Au 11	12 15	.....	.....	.....	do	16	Choppy.

PACIFIC OCEAN.

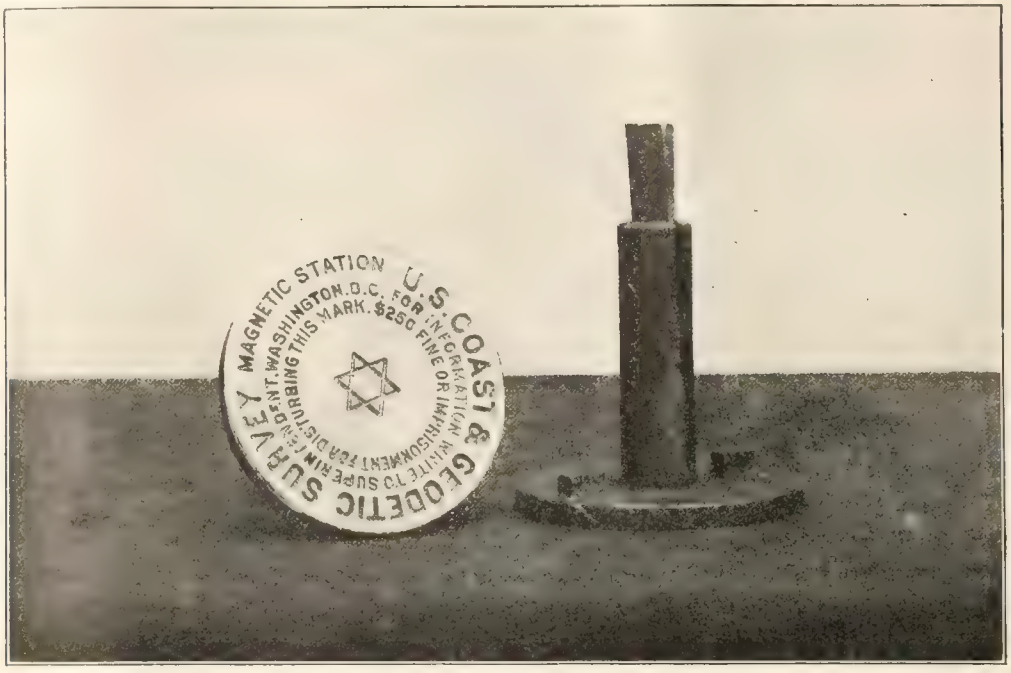
	° ′	° ′		*East.*	° ′	*c. g. s.*	*c. g. s.*			
At sea	29 53	155 40	No 13	12 27	.....	.....	.....	Patterson	8	Lt. sw.
Do	34 08	155 10	No 11	14 54	.....	.....	.....	do	7	Lt. sw.
Do	37 38	154 00	No 9	16 02	.....	.....	.....	do	8	Lt. sw.
Do	44 29	152 56	No 7	17 56	.....	.....	.....	do	8	Lt. sw.
Puget Sound	47 34	122 29	My 19	23 56	70 50	.1926	.5865	do	8	Sm.
Elliott Bay	47 37	122 23	Ap 15	23 30	.....	.....	.....	McArthur	16	Sm.
Union Bay	49 35	124 53	Ap 18	26 02	.....	.....	.....	do	16	Sm.
Unalaska Bay	53 56	166 27	Oc 31	16 50	66 50	.2078	.5281	Patterson	8	Sm.
Davidson Bank	54 05	163 00	Se 15	17 48	67 18	.2064	.5348	do	8	Mod. sw.
Near Dolgoi Island	55 08	161 56	Oc 6	18 02	68 44	.1942	.5354	do	2	Sm.
Near Ukolnoi Island	55 12	161 44	Oc 6	18 40	68 12	.1992	.5363	do	8	Lt. sw.
Off Sand Pt	55 18	160 32	Oc 13	18 28	68 31	.1979	.5403	do	8	Sm.
Burnett Inlet	56 04	132 30	My 12	30 29	.....	.....	.....	McArthur	8	Sm.
Shelikof Strait	56 50	156 14	Je 3	22 00	70 20	.1867	.5549	Patterson	8	Lt. sw.
Wrangell Narrows	56 51	132 55	Oc 30	30 07	.....	.....	.....	McArthur	16	Sm.
Icy Strait	58 17	136 23	Oc 6	32 24	.....	.....	.....	do	16	Sm.
Kuskokwim Bay	58 47	162 02	Jy 3	19 02	70 40	.1783	.5386	Explorer	16	Sm.
Off Yakutat Bay	59 14	140 36	Oc 5	30 12	.....	.....	.....	McArthur	16	Mod. sw.
Iniskin Bay	59 40	153 24	Se 23	27 44	.....	.....	.....	do	8	Sm.

DESCRIPTIONS OF STATIONS.

Magnetic observers are instructed to mark every station in as permanent a manner as possible, either with a stone or a post of some durable wood, so that it may be available for future occupation. They are also required to furnish a sufficiently detailed description to locate the station even if the mark should be destroyed, and to determine the bearings of two or three prominent objects in addition to the one used as a reference mark in the azimuth and declination observations. The information is given in abridged form on the following pages. Further details can usually be obtained upon application to the Superintendent of the Coast and Geodetic Survey.

The usual method of marking a station is by a stone post about 3 feet long and 6 inches square, set so as to project 2 or 3 inches above the ground. In the center of the top is set a circular brass plate 3½ inches in diameter, lettered as shown in the illustration below. When the local authorities desire it and are willing to bear the expense, a second stone is set to mark the true meridian.

The descriptions of stations are arranged alphabetically by States and by names of stations.


U.S. COAST & GEODETIC SURVEY
MAGNETIC STATION
DEPT. WASHINGTON, D.C.
DISTURBING THIS MARK. $250 FINE OR IMPRISONMENT FOR DISTURBING
INFORMATION

ALASKA.

Dutch Harbor.—The station is on Amaknak Island on the hill just southeast of the village of Dutch Harbor, near the station of 1908. It is about 164 feet south of a water tank covered with sod and 98 feet south of the azimuth mark, on a line from the azimuth mark to the astronomical station in Unalaska. The station is marked by a bottle with its top 1 foot below the surface and by a bowlder 6 by 10 by 16 inches, with a 1-inch drill hole to mark the exact spot. The astronomical station at Unalaska bears 0° 01′.0 west of true south.

Goodnews Bay.—The magnetic station is 73 feet northeast of triangulation station Northeast Base, in prolongation of the line from Southwest Base.

Northeast Base is on the south spit at the entrance to the bay. It is about 650 feet from the extreme northerly point of the spit and about 65 feet from high-water mark on the bay side. It is marked by a copper bolt set in a concrete base about 1 foot square.

Sand Point, Popof Island.—The magnetic station is identical with Sand Point astronomical station and triangulation station West Base. It is on the highest land at the western end of Sand Point, which is a flat gravel spit about one-half mile long at the west end of Popof Island. It is on a low gravel ridge which runs north and south across the end of the point, about 53 feet inside the edge of grass. The station is marked by a brass tube set in a cement pier 15 by 25 inches and 20 inches high, which is lettered "Sand Point, Astronomical, 1913."

ARKANSAS.

Charleston, Franklin County.—The station is in the southwestern part of the Confederate Veteran's reunion grounds, about 2½ miles southeast from the town's center. It is 320.4 feet south from the south rail of the Arkansas Central Railway track, 124 feet east from the fence across the road to the west, and 32 feet northwest from the center of the trunk of a small lone oak tree. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 5 inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′	
Cross on Catholic Church steeple (mark)	74 33.5	west of north
East gable of farmhouse	75 59.4	west of north
Top of tallest monument in the cemetery	68 41.8	west of north

ARKANSAS—continued.

Conway, Faulkner County.—The station is in the western part of the campus of Hendrix College, about three-fourths mile north from the town's center. It is 123.7 feet east from the fence on the west border of the campus, and 282 feet northwest from the northwest corner of the main college building. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 5½ inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′
Lower southwest corner of main college building (mark)	45 20.9 east of south
South gable of Prof. G. A. Simmons's house	0 27.9 east of north
Lower southeast corner of east wing of college dormitory	61 17.1 east of north
Top of south gable window of Mrs. G. W. Hill's house	19 06.0 east of north
Top of courthouse cupola	1 03.2 east of south

A limestone post 5 by 6 by 28 inches, projecting about 2 inches above the ground, was set 640 feet due north of the magnetic station to mark the north end of a meridian line.

Fayetteville, Washington County.—The station is in the southeastern part of the campus of the Arkansas State University, about 1 mile northwest of the town's center. It is 472.5 feet a little south of east from the southeast corner of Engineering Hall, 88.9 feet north from the edge of the curb on the south border of the campus, and 149.5 feet southeast from the center of the trunk of the only cedar tree in this part of the ground. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 5 inches above the ground, and having a bronze magnetic station marker in the top. The following true bearings were determined:

	° ′
Top of cupola of county courthouse (mark)	66 32.0 east of south
Southeast corner at top of north cupola on main university building	32 19.6 west of north
Southeast corner at top of south cupola of main university building	30 26.3 west of north

Fort Smith, Sebastian County.—The station is the north stone of an old meridian line in the northeastern part of the city park, about three-fourths mile southwest from the town's center. It is about 120 feet south from the north park fence, and about 141 feet northeast from the northeast corner of the park caretaker's house. The station is marked by a limestone post 6 by 6 inches at the top, which is about 5 inches above the ground. A hole filled with lead indicates the exact spot. The following true bearings were determined:

	° ′
South meridian stone (mark)	0 00.4 east of south
Lower south edge of a wall left standing from a ruined building	82 04.4 west of south
Upper southwest corner of central building of Fort Smith terminal warehouse, under eaves	66 36.2 east of south
Lower northwest corner of caretaker's house in park	27 09.7 west of south

A similar stone to that of the magnetic station, and 364 feet distant, marks the south end of the meridian line.

Huntsville, Madison County.—The station is in the southwest part of a pasture belonging to Judge V. N. Cannon, about 400 feet northeast from the flour mill and about one-fourth mile northeast from the town's center. It is 95 feet north from the northeast corner of the stone fence surrounding the field east of the flour mill and 122.2 feet southeast from the center of the trunk of an oak tree, about 2½ feet in diameter. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 5 inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′
Upper northwest corner of courthouse under eaves (mark)	77 54.7 west of south
East gable of north wing of City Hotel	72 00.6 west of south
Upper southeast corner of First National Bank	73 25.0 west of south
East gable of schoolhouse	46 57.6 west of south
East gable of south wing of City Hotel	70 47.5 west of south

Lonoke, Lonoke County.—The station is in the northeastern corner of a large tract of ground belonging to Mr. Field, about three-fourths of a mile west from the village center. This land is west and northwest across the road from the cemetery, and the station is at the inside corner where the road running north on the west side of the cemetery turns almost directly west. The station is 175 feet west from the east fence line of this ground, and 220 feet south from the north fence line. It is marked by a limestone post 6 by 6 by 30 inches projecting about 5 inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′
Top of courthouse cupola (mark)	67 58.4 east of south
Top of water tank on cotton gin	46 01.1 east of south
Top of highest water tank of rice mill	32 10.1 east of south
South gable on Mr. Love's farmhouse	23 29.4 west of north

ARKANSAS—continued.

Morrilton, Conway County.—The station is in the northeastern part of the infield of the race track at the county fairgrounds, about three-fourths mile east from the town's center. It is 209 feet west and 95.5 feet south from the fence on the inside of the race track. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 3 inches above the ground. The following true bearings were determined:

	° ′
Top of African Church steeple (mark)	78 37.6 west of north
Base of cross on cupola of Catholic school	68 06.4 west of south
Base of cross on Catholic Church steeple	55 56.2 west of south
Top of cupola of public school	2 53.9 east of south

Ozark, Franklin County.—The station is in the southern part of a piece of ground belonging to W. W. Adams, abstractor of deeds, about one-half mile east from the town's center. It is about 550 feet south of east from an iron gate at the entrance to this ground, and east of south from a well-known spring in the western part of the same. It is 104.2 feet north from the fence on the south border of the ground, and 202.3 feet east from an old stone wall. The station is marked by a limestone post 6 by 6 by 30 inches, projecting about 3 inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′
Top of courthouse clock tower (mark)	61 56.2 west of south
Top of cupola of People's Bank	63 12.1 west of south
Top of cupola of Nazarene Church	72 45.6 west of south
Top of cupola of Presbyterian Church	76 16.3 west of south
Top of steeple of Baptist Church	82 39.7 west of south

A north meridian point, about 275 feet distant, was marked by an oak stake 18 inches long and 2 inches in diameter A nail in the top marks the exact spot. This stake is to be replaced by a suitable monument by the county officials.

Paris, Logan County.—The station is in the northwestern part of the county fair grounds, about 2½ miles northeast from the town's center. It is 212.3 feet east from the fence on the west border of the grounds and 172.4 feet south from the southeast corner of a small exhibition building about 23 by 18 feet. The station is marked by a marble post 4 by 6 by 30 inches, projecting about 5 inches above the ground, and lettered U. S. C. & G. S. A small hole in the center of the top indicates the exact spot. The following true bearings were determined:

	° ′
Top of southwest tower of Subeaco College (mark)	86 59.6 east of south
West gable on William Forest's farmhouse	76 58.3 east of north
West gable on G. C. Werschky's house	63 06.4 east of north
Top of northwest corner tower of Subeaco College	87 30.6 east of south

COLORADO.

Alamosa, Conejos County.—The station is in the northwestern corner of the high school grounds, about one-half mile west of town's center. It is 150 feet northwest of the northwest corner of the high school, 48 feet south of the north fence, 34 feet east of the west fence, and 54 feet southeast of a large cottonwood tree in the corner. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with a brass plate in the top which sets flush with the ground. The following true bearings were determined:

	° ′
Ball at apex of steel water tower (mark)	24 01.7 east of south
Right edge of high school building, 4 feet from ground	31 43.6 east of south
Left edge of high school building, 4 feet from ground	58 42.5 east of south
South gable of cottage built of cement blocks	1 16.0 east of north
Southwest corner of brick cottage	50 42.5 west of north

Breckenridge, Summit County.—The station is about three-fourths of a mile southwest of town. It is on a table overlooking the Blue River Valley to the east. It is about 400 feet north of the point where Lehmen's Creek enters the valley and 20 feet west of the north end of an abandoned flume. This flume terminates in a ditch which circles the magnetic station on the north. It is also about 35 feet from the brow of the hill on the east and spruce trees border it on the west. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with a brass magnetic station mark in the top which projects 3 inches above the ground. The following true bearings were determined:

	° ′
Ball at apex of cupola on courthouse (mark)	20 28.4 east of north
West gable of a log house in south part of town	56 42.2 east of north
Monument near center of top of Mount Baldy	63 43.8 east of south
Monument at apex of Peak No. 8 on Ten-mile range	87 37.6 west of south

COLORADO—continued.

Central City, Gilpin County.—The station is in a small pasture northeast of a stone slaughterhouse, about 1½ miles west of the town's center. It is 120 feet north of an exposure of rocks, 220 feet northeast of the northeast corner of the slaughterhouse, 107 feet southwest of a lone pine tree, 92 feet southwest of the northwest corner of a garden fence, and 19 feet south of the line of the north garden fence. The station is marked by a Bedford limestone post 6 by 6 by 30 inches, with brass plate in top and sunk level with the ground. The following true bearings were determined:

	° ′
Right edge of low flat monument in I. O. O. F. cemetery (mark)	19 48.0 east of south
U. S. G. S. iron post along fence north of road to town	20 24.0 east of south
Intersection of the right-hand side of James Peak with foothills	69 49.4 west of north
Right edge of cross on round brick vault in Catholic cemetery	85 33.0 east of north
Right-hand chimney of house in ravine across canyon	81 43.0 east of north

Creede, Mineral County.—The station is on the brow of the high hill about one-half mile west of the town's center. It is in line with the north side of Fourth Street produced westward, between the road on the hill and the brow of the hill. It is 205 feet northeast of a bridge across a ditch, 92 feet east of this ditch, 320 feet north of a house, 500 feet east of the east cemetery fence, and 23 feet south of the line of the fence which separates the Catholic and Protestant cemeteries. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with a brass plate in the top, which projects about 2 inches above the surface. The following true bearings were determined:

	° ′
Congregational Church spire (mark)	76 30.3 east of north
Cross on Episcopal Church	86 00.4 east of south
East gable of vault in Catholic cemetery	82 45.2 west of south
Right edge of right steel chimney at power plant in Willow Creek canyon	14 00.8 east of north
Southwest corner of brick flat	47 17.8 east of north

Cripple Creek, Teller County. The station is near the center of the Mount Pisgah cemetery about 1 mile west of the town's center. It is about in line with the Catholic Church spire and the G. A. R. monument, and in the center of the first north and south alley west of the cabin. It is 59 feet west of the northwest corner of the cabin; 77 feet northwest of the G. W. Walters monument; 82 feet southwest of the F. R. Skipwith monument; 61 feet south of the Elizabeth Peterson monument. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with brass plate in top and projecting about 3 inches above the ground. The following true bearings were determined:

	° ′
Cross on Catholic Church spire (mark)	86 50.9 east of north
Spire on cupola of high school	86 38.0 east of south
Southwest corner of Placer school building	83 10.8 east of south
Northwest corner of brick building in northeast part of town	74 54.4 east of north

Durango, La Plata County.—The station of 1905 was reoccupied. It is on the mesa about one-half mile northeast of the town, on land leased by the town near reservoir No. 1. It is 71.3 feet west of the southwest corner of the wooden fence surrounding reservoir No. 1 and 117.8 feet south of the southwest corner of a small wooden tower upon which is a water gage. The station is marked by a 4-inch glazed pipe partly filled with cement. The cement is lettered U. S. The following true bearings were determined in 1905:

	° ′
Point at top of eastern clock on courthouse	49 49.4 west of south
Methodist Episcopal Church spire	50 23.0 west of south
First Presbyterian Church spire	58 24.0 west of south
Flagstaff on City Hall cupola	53 49.8 west of south
Apex of steel watertank on side of mountain southwest of town	32 27.7 west of south

Fairplay, Park County. The station is in Judge Wilkin's park, about one-half mile northwest of the town's center. It is on the south side of the grove and southeast of the reservoir. The fence which passes on the east side of the judge's office if produced northward would pass 19 feet east of the station. It is 275 feet west of the east fence around the park, 329 feet north of the south fence, 16 feet southeast of the nearest spruce tree, and 61 feet south of a large rock in the south edge of the grove. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in top projecting 2 inches above the ground. The following true bearings were determined:

	° ′
Right edge of courthouse (mark)	12 06.5 west of south
Base of cross on Catholic Church cupola	12 55.6 east of south
Center of top of cupola on school building	16 25.7 east of south
North edge of north chimney on house in north part of town	35 00.0 east of south
Monument at apex of mountain southwest of town	67 47.1 west of south

COLORADO—continued.

Golden, Jefferson County.—Station is near the band stand in the highest part of the city park, about one-fourth mile south of the town's center. It is 121 feet southwest of the band stand, 112 feet east of a drinking fountain, 143 feet northeast of the street on the southwest side of the park, and 50 feet northwest of a tree. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in top and set flush with the ground. The following true bearings were determined:

	°	′	
Southwest corner of brick house south of town (mark)	43	43.1	west of south
Northeast corner of brick house just southwest of park	80	43.4	west of south
Righthand flagstaff of west pavilion on castle rock	49	15.7	east of north
Righthand edge of brick bungalow just northeast of park	55	24.4	east of north
Left edge of brick house near south corner of park	18	41.6	east of south

Grand Junction, Mesa County.—The station of 1905 was reoccupied. It is in the northeast corner of the fairgrounds, northeast of the race track and grand stand, and about 1½ miles northeast of the town. It is 102.7 feet south of the north fence of the fairgrounds, 215.7 feet west of the fence on the east, and 225.5 feet north of the outside fence on the north side of the race track. The station is marked by a sandstone post 6 by 6 by 30 inches, projecting about 3 inches above the ground and lettered U. S. C. & G. S., 1905. The following true bearings were determined:

	°	′	
Left edge of rock exposure at tip of mesa (mark)	0	24.5	west of north
Flag pole on judges' stand	16	27.7	west of south
East gable of a house	40	41.9	west of north

Greeley, Weld County.—The old station could not be recovered. A new station was established about 200 feet south of the probable location of the old station. It is in a small park just across the road south of the county fairgrounds, about three-fourths of a mile north of town. It is 122 feet east of the east side of the street leading to town, 62 feet northeast of a hydrant, 41 feet west of the edge of the road on the east, 42 feet southwest of a cottonwood tree, and 47 feet south of the south side of the road between the race track and magnetic station. The station is marked by a limestone post 5 by 10 by 16 inches, set flush with the ground. The following true bearings were determined:

	°	′	
Right edge of right brick chimney on pumping station (mark)	49	55.8	west of south
Northeast corner of main building at fairgrounds	47	44.6	west of north
Left edge of brick chimney on potato oven	22	44.2	west of north
Left edge of chimney on cottage southeast of fairgrounds	82	25.2	east of south

Lake George, Park County. The station is on the Government ranger station, about one-fourth mile east of the village. It is 122 feet northeast of the northeast corner of the rangers' house, 190 feet east of the west fence, 110 feet south of the barn, 81 feet north of a pine tree, and 125 feet north of the south fence. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, projecting 1 inch above the ground, and having a brass magnetic station marker in the top. The following true bearings were determined:

	°	′	
South edge of south chimney of hotel at Lake George (mark)	81	36. 3	west of north
North edge of north chimney at hotel	79	52. 2	west of north
East gable of William Norton's house west side of valley	58	02. 4	west of north
Extreme east edge near top of large rock on small hill east of town	11	53. 4	west of north

Leadville, Lake County.—The station is in the baseball park, about three-fourths of a mile north of the town's center. It is within the race course, near the north end, about in line with the monument on Prospect Mountain and the east end of the south barn at the race track. It is 239 feet south of the northernmost part of the fence outside the track; 286 feet from this same fence in line with Prospect Mountain; 212 feet northeast of the south gate post to the track, and 194 feet east of the west fence in line with the north barn. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with brass plate in top which projects about 1 inch above ground. The following true bearings were determined:

	°	′	
Cross on Catholic Church spire (mark)	50	13.8	east of south
Right edge of brick high school building	38	53.7	east of south
Apex of Mount Elbert	39	43.1	west of south
Monument at top of Prospect Mountain	63	29.8	east of north
Flagpole on the Ninth Street school building	59	19.2	east of south

Ouray, Ouray County.—The station is about one-half mile southwest of the town's center and about 300 feet northeast of the entrance to Box Canyon. It is at the base of the hill east of Box Canyon, between Box River and Uncompahgre River, 160 feet east of a drinking fountain on a little hillock, 110 feet south of the southwest corner of the dance hall, and 22 feet west of the west side of the dance hall produced. The station is marked by a Bedford limestone post

COLORADO—continued.

6 by 6 by 20 inches, with a brass plate in top which sets flush with the ground. The following true bearings were determined:

	° ′
Flag pole on high school cupola (mark)	44 53.6 east of north
Flag pole on city hall cupola	47 33.0 east of north
Southwest corner of the Saloon office building	40 38.8 east of north
Flag pole at center of top of lone pinnacle of rock on mountain west of Box Canyon	41 10.1 west of north
Center of pinnacle of rock on mountain southeast of town	62 08.1 east of south

Ridgeway, Ouray County. The station is on the high-school grounds one-fourth mile south of the town's center. It is in line with the west side of the high school building, 83 feet south of the southwest corner, 95 feet southwest of the southeast corner, and 31 feet north of the south fence. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with a brass plate in top which sets flush with the ground. The following true bearings were determined:

	° ′
Cross on Catholic Church spire (mark)	54 52.4 east of north
Spire at center of top of railroad water tank	75 09.2 east of north
West gable of barn at the Uncompahgre Hot Springs	52 12.1 east of south
North gable of farmhouse	46 54.8 west of south
East gable of farmhouse	74 57.2 west of south

Saguache, Saguache County. The station is on the county high-school grounds, about 40 rods southeast of the town's center. It is 400 feet east of the northeast corner of the high-school building, 71 feet west of the board fence on the east; 191 feet south of the north fence; 74 feet north of the south fence; 89 feet northwest of the northwest corner of a small barn, and 20 feet north of the south side of the high school produced eastward. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with a brass magnetic station mark in top which sets flush with the ground. The following true bearings were determined:

	° ′
Monument at apex of mountain southwest of town (mark)	58 35.9 west of south
Base of flagpole on county high school	86 32.5 west of north
Right edge of county high school	77 09.4 west of north
Church spire north of high-school grounds	16 52.8 west of north
Right edge of low square monument in east part of cemetery	62 08.5 east of south

Salida, Chaffee County.—The station is in Marvin's ball park, about three-fourths mile west of town's center. It is near the south bank of the Arkansas River and about the north central part of the park, outside of the old race track. It is 25 feet south of the river bank, 42 feet southeast of a large pine tree, 37 feet north of the crest of the old race track, 298 feet northwest of home base, and 313 feet northwest of the northwest corner of the grandstand. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in the top, projecting 2 inches above the ground. The following true bearings were determined:

	° ′
West gable of brick house (mark)	8 43.5 west of south
Right edge of brick chimney on house at southwest corner of park	59 26.4 west of south
North gable of small brick house on mesa	37 31.5 west of south
Point at apex of more easterly of two sharp peaks southeast of town	5 55.6 east of south

Silverton, San Juan County.—The station is near the southwest corner of the baseball park, about one-half mile southwest of the town's center. It is 31 feet east of the west corner of the fence, 92 feet north of the south corner, 26 feet southeast of the northwest fence, and 244 feet southwest of the west corner of the grandstand. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in the top which sets flush with the ground. The following true bearings were determined:

	° ′
Cross on Catholic Church spire (mark)	26 03.9 east of north
Center of clock dial on courthouse tower	33 29.0 east of north
South gable of large house southeast of town	52 20.0 east of north
Flagpole on Mount Kendal	65 21.4 east of south
Monument on top of mountain toward Ouray	67 24.1 west of north

Telluride, San Miguel County.—The station is in the baseball park, about one-fourth mile west of the town's center. It is near the board fence on the west side of the ball ground, 110 feet west of the southwest corner of the grandstand, 73 feet from first base, 28 feet east of the west corner of the fence, and 15 feet northwest of a line drawn through home

COLORADO—continued.

base and first base. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with brass plate in top which sets flush with the ground. The following true bearings were determined:

	°	′	
Congregational Church spire (mark)	79	28.5	east of south
Flagpole at center of Needle Rock on mountain south of town	17	37.0	east of south
Tip of south gable of high school	89	16.1	east of south

Westcliffe, Custer County.—The station is in the ball park, one-fourth mile north of town. It is south of the ball diamond and about in line with first and second bases. A line drawn through these two bases would pass about 4 feet to the west of the magnetic station. It is also about in line with the grandstand and Silvercliffe. It is 125 feet east of the race-track fence, 71 feet southwest of first base, 120 feet from home base, and 142 feet from the southeast corner of the grandstand. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in the top, set flush with the ground. The following true bearings were determined:

	°	′	
Cross on Catholic Church steeple in Westcliffe (mark)	23	58.5	east of south
Presbyterian Church spire in Silvercliffe	75	34.5	east of south
Iron post in rock pile, top of Ben West hill	18	05.5	east of north
East gable of Clifton's hay barn	65	35.6	west of south
Extreme top of Horn's peak	43	01.1	west of south

CONNECTICUT.

Canaan, Litchfield County.—The station of 1910 was reoccupied. It is in the Canaan cemetery, about 1 mile south of town, in the new part, near the northwest corner, and about 600 feet west of the main entrance. The point is in the grass, but not on any lot; it is 24 feet southeast of the southeast corner of the base of the large Van Deusen Monument, 16.5 feet south-southwest of the southwest corner of the tombstone of Milton J. Killmer, and about 100 feet south of the north fence of the cemetery. It is marked by a block of concrete 6 by 6 by 14 inches, having three one-half-inch holes in its face, along a diagonal, and set flush with the ground. The following true bearings were determined in 1910:

	°	′	
Spire of Canaan Church (mark)	25	52.4	east of north
Chocolate-colored monument in southeast part of cemetery	18	57.4	east of south
Eddy monument (grayish white)	29	39.3	west of south

New Hartford, Litchfield County.—The observations were made in the Protestant cemetery, one-fourth of a mile west of the village center. It is in the northwest corner of the cemetery, on the west side of Avenue F, 0.9 foot southwest from the corner marker between lots 294 and 295, 7 feet from lot marker 294, and 5.2 feet from lot marker 295. (The lot marker sets in the center of the lot.) The station is marked by a 4-inch tile, set flush with the ground, with a brass magnetic station mark in the top. The following true bearings were determined:

	°	′	
Cross on central building of St. Mary's Parochial School (mark)	12	47.6	east of south
Congregational Church steeple, center of ball	87	12.2	east of south
Southwest corner of cupola on white house on distant hill	40	47.2	east of north
Dark-brown monument, most easterly one (Birney Monument)	71	56.1	east of south

Norfolk, Litchfield County.—The station is on the new high-school grounds, about one-fourth of a mile north of the depot. It is on a mound east-northeast of the high-school building, on the northern part of the property. It is 49 feet south of the fence, 55 feet south of the cherry tree on side of hill, 50 feet from a cherry tree 50 feet east of above, 51 feet from a maple tree, about 70 feet north of intersection of two small streams, and about 80 feet from a large maple tree with very low branches. The station is marked by a 4-inch tile, projecting one-half inch above the ground, and having a bronze magnetic station mark cemented in the top. The following true bearings were determined:

	°	′	
Congregational Church steeple (mark)	0	49.5	east of south
Cupola on Norfolk Inn, northeast edge	16	17.4	west of south
Cross on Catholic Church	59	38.5	west of south
Peak of cupola on barn of Brown Lumber Co	46	50.0	east of south
Cupola on large gray barn	17	13.9	east of south

Simsbury, Hartford County.—The station is on the high-school grounds, about one-fourth of a mile north of the railroad station, west of the main street. It is in the northwest portion of the high-school lot, 149 feet from northwest corner of high school, 34.6 feet from westernmost apple tree, 75 feet from southeast corner of Blue House, and 59.5 feet

CONNECTICUT—continued.

east of a large oak tree. The station is marked by a 4-inch tile set flush with the ground, with a bronze magnetic station mark cemented in the top. The following true bearings were determined:

	°	′	
Cupola on green barn (mark)	35	28.1	east of south
Cupola with green shutters on gray barn	52	01.2	east of north
Southeast edge of ornament on top of southeast corner of grammar school	83	58.4	west of south
Northwest corner of chimney on green house south of high school	0	40.6	west of south

Unionville, Hartford County.—The station is on a rocky hill, about 1 mile north of the railroad station, and one-third of a mile east of the Unionville-Canton road, on the property belonging to J. W. Curtis. It is on the southwest part of the top of the hill, 145 feet east-southeast from the largest exposed rock on that part of the hill, about 330 feet south-southeast of a large oak tree, and about 25 feet from the exposed rock ledge. The station is marked by a 4-inch tile, projecting about 1½ inches above the ground, with a bronze magnetic station mark cemented in the top. The following true bearings were determined:

	°	′	
Congregational Church steeple (mark)	28	25.2	west of south
Catholic Church steeple	51	39.2	west of south
Red-roofed cupola on gray barn	43	05.8	west of north
Knob on top of gray silo	68	15.3	west of south

DELAWARE.

Ashland, Newcastle County.—Observations were made in a field belonging to Mr. Armstrong, about a mile south-southeast of Ashland Station, near the top of a hill which is just north of a higher hill. The field is on the east side of the road. The point at which observations were made is 34 feet east of a wire fence and a wild cherry tree 2 feet in diameter in the fence line, and 100 feet north of the south fence of the field.

Bellevue, Newcastle County.—Observations were made at a point near the railroad station, in a field belonging to Mr. King, on the northwest side of the road parallel to the railroad track. The point is 260 feet nearly west from the gate to the field, 150 feet south of a weeping willow tree 4 feet in diameter, 195 feet southwest of another weeping willow tree 3 feet in diameter, and 210 feet southeast of the fence at the back of the field. It is marked by a red cedar post 5 inches in diameter and 3.5 feet long, buried with 15 inches projecting out of the ground. The center of the rings of growth at the top of the post marks the exact spot. The following true bearings were determined:

	°	′	
East gable of spring house 500 feet away (peak of white stone part) (mark)	70	23.4	west of south
South gable of large white barn across the river	62	34.7	east of south
West gable of white house across the river	62	01.4	east of south

Brandywine, Newcastle County.—Observations were made in a field belonging to Mr. Passmore, directly back of his house, which is located on the east side of the West Chester turnpike, about 800 feet south of the cross roads with tavern and church. The point at which observations were made is about half way between the north and south fences of the field, and is about 270 feet east of the gate to the field.

Carpenter, Newcastle County.—Observations were made on the farm of Mr. C. W. Hanby, three-fourths of a mile west of Carpenter Station, on the south side of the main road leading west from Carpenter. The observations were made in a field just west of the house and south of the highway, at a point 78 feet east of the west fence, 190 feet west of the gate next to the barn, and 197 feet south of the northwest corner of the field.

Claymont, Newcastle County.—Observations were made at a point about 800 feet east of the railroad station and about 60 feet back from a stone wall along the Delaware River front. The point is on a 10-acre tract with several ruined houses on it, under the agency of the Wilmington Trust Co. It is about 250 feet northeast of a small cottage used for camping.

Cliffs, Newcastle County.—Observations were made in a field about one-half mile west-northwest of Cliffs Station, just south of the highway and just west of a small tributary of Shellpot Creek, spanned by a concrete bridge. The point at which observations were made is 50 feet south of a stone wall at the north of the field, and about 150 feet west of the edge of some woods.

Concord, Newcastle County.—Observations were made in a field belonging to Mr. J. Atwood Weldon, about a mile north of Concord Station, and just north of the grounds of the Porter Reservoir. The field is the second one east of the West Chester turnpike, and is reached by a lane running south from Mr. Weldon's house, the gate being about 500 feet south of his barn. The point at which observations were made is 85 feet south of the north fence of the field, and 90 feet east of the west fence.

Felton, Kent County.—Observations were made at a point about 1 mile south-southwest of town, reached by the main highway to Harrington. The point is in a pasture just west of the highway, belonging to Mr. George Hering. It is 103 feet west of the fence on the west side of the highway, and 43 feet south of a fence at the south side of a lane leading to a house about 500 feet from the highway. It is marked by a piece of 4-inch clay drain pipe, about 20 inches

DELAWARE—continued.

long, set with the end about 1 inch above the ground, and having its upper end filled with neat Portland cement with the regular magnetic station mark embedded in it. The following true bearings were determined:

	°	′	
North gable of larger and more easterly of two barns near together, about 1,200 feet away (mark)	1	50.9	east of south
North gable of barn about 1,000 feet away	16	35.3	west of south
Steeple of church	18	05.8	west of north
West gable of barn about 800 feet away	71	29.2	east of north

Granogue, Newcastle County.—Observations were made at a point about half a mile southwest of Granogue, near the highest point of what seemed to be the highest hill in sight. The point is in an open field, and is reached by a lane leading west, or northwest, from the main road. It is about 600 feet from the main road, about 60 feet northeast of a fence on the southwest side of the lane just mentioned, and about 250 feet west-southwest of a tree 3 feet in diameter.

Greenville, Newcastle County.—Observations were made about one-half mile south of Greenville station, in a field at the corner of Kennett Pike and a road branching from it to the west, on the south side of the latter road. The point at which observations were made is about 500 feet west of Kennett Pike, about 40 feet south of the north fence of the field, and about 50 feet southwest of a maple tree 18 inches in diameter, just outside the fence.

Guyencourt, Newcastle County.—Observations were made about one-third of a mile south of Guyencourt Station, about 700 feet eastward and uphill from the macadamized highway leading to Montchanin, in a field south of a barn. The point at which the observations were made is about 80 feet south of a stone wall at the south side of the barnyard, and about 100 feet east of a wire fence.

Henry Clay Factory, Newcastle County.—Observations were made in a field about a mile northeast of Henry Clay Factory, on the southwest side of the road from Wilmington to Rockland, and just northwest of the road branching from it to Henry Clay Factory. The point at which observations were made is about 100 feet southwest of the Rockland road, about 300 feet northwest of the Henry Clay Factory road, and about 75 feet south of a bowlder with two trees close to it.

Hockessin (Station No. 1), Newcastle County.—Observations were made in a field about a mile and a half northwest of Hockessin Station, and one-third of a mile beyond a road branching to the north. The field is on the north side of the road leading to Avondale. The point at which observations were made is about 200 feet west of the top of the hill, 150 feet northeast of a house and barn across the road, 80 feet north of the south fence of the field, and 60 feet from a marble post in the field which probably marks the State boundary line.

Hockessin (Station No. 2), Newcastle County.—Observations were made in a field about 1 mile east of Hockessin Station, on the south side of the macadamized highway, near the top of a hill, at a point about 80 feet south of the north fence of the field, and 150 feet east of a road turning off to the south.

Montchanin (Station No. 1), Newcastle County.—Observations were made at a point about one-fourth of a mile north of the railroad station, in a field belonging to Col. Dupont and rented to Mr. Latimer. The field is on the west side of the turnpike from Wilmington to West Chester, and is the second field north of the corner with a road leading from Montchanin to the Kennett Pike. The point is near the top of the hill, and 90 feet north of the south fence of the field.

Montchanin (Station No. 2), Newcastle County.—Observations were made in a field belonging to Col. Dupont, about 1¼ miles west of Montchanin, on the south side of the highway to Ashland, about 500 feet beyond the place where a road forks off to the southwest. The point at which observations were made is near the top of the hill, and about 100 feet south of the north fence of the field.

Mount Cuba, Newcastle County.—Observations were made at a point about one-fourth of a mile east northeast of Mount Cuba Station, in a field on the south side of the macadamized highway. The field has a large rocky mound in the west part of it, and is at the top of a hill. The point for observing was just east of the mound, and 70 feet south of the edge of the road.

Rockland (Station No. 1), Newcastle County.—Observations were made in a field about 1¼ miles east of Rockland, at the southwest corner of the West Chester turnpike and a road leading from Rockland to it. The field belongs to Mr. McGill and is just north of his house. The point at which observations were made is about 250 feet northwest of the house, about 250 feet west of the east fence of the field, and about 190 feet north of the northwest corner of the barn.

Rockland (Station No. 2), Newcastle County.—Observations were made in a field belonging to Mr. Townsend, about one-fourth of a mile south of Rockland on the east side of the road to Wilmington. The field is the first one south of the house, and second one back from the road. The point at which observations were made is about 400 feet south of Mr. Townsend's house, 80 feet east of a fence and line of trees, and 50 feet south of a hedge.

Silverside, Newcastle County.—Observations were made in a field belonging to Mr. S. H. Trump, located just east of the macadam road leading from the Philadelphia turnpike to Silverside and Talleyville. The point at which observations were made is about 270 feet east of the gate to the field, about 700 feet southwest of Mr. Trump's house, about 500 feet south of a cottage or bungalow on the Trump property, about 110 feet south of a fence south of a lane between the cottage and the point, and about 40 feet southeast of two flat rocks, one of which is about 20 by 40 feet, and the other about 10 feet square.

DELAWARE—continued.

Talleys Corner, Newcastle County.—Observations were made in a field belonging to Mr. Squibb, about a mile southwest of Talleys Corner, just northeast of Shellpot Creek and southeast of the highway to Wilmington. The point at which observations were made is about 400 feet northeast of the creek, about 300 feet southeast of the highway, 80 feet southwest of a stone wall next to the lane leading to the house, and about 175 feet northwest of a hickory tree 2 feet in diameter.

HAWAII.

Hilo, Cocoanut Island, Hawaii Island.—The station of 1906 was reoccupied. It is the triangulation station "Mokuola," and is marked by a triangular concrete monument, about 4 feet on each side, having a granite stone set in the center of it. It is inscribed "Bureau of Public Lands, A. B. Lobenstein, 1896." In 1906 this whole monument had apparently shifted about 18 inches toward the northwest and subsided somewhat (especially on the northwest side), so that it was no longer level, on account of the washing out of the sand on the northwest side by the action of high waves. Now (in 1913) it has apparently shifted slightly farther toward the northwest. The observations were made over the center of the stone in its present position. The following true bearings were determined:

	° ′
Base of flagstaff on Mooheau Hall	67 05.5 west of south
Extreme point of headland seen at left of Hilo Bay at horizon	6 08.5 west of north
Point of cupola on low building a little to right of end of railroad wharf	59 37.2 west of south
Point of cone-shaped cupola on large residence in Hilo, (on high ground, stands out prominently)	76 10.2 west of south

Hilo, Mooheau Park, Hawaii Island.—The station of 1906 was reoccupied. It is near the center of the park, about 100 yards from the seashore. It is directly in line with the second row of pillars in Mooheau Hall and 220 feet from the nearest pillar in that row. It is 182.5 feet from the fence along the street and about 72 yards from the railroad along the beach. It is marked by a rough stone 16 inches long and about 6 inches square set flush with the ground and having a half-inch drill hole to mark the exact point. The soil here is black sand. The following true bearings were determined in 1913:

	° ′
Spire of Mormon Church (mark)	18 49.8 west of south
Spire of church seen over Wise Building	82 46.1 west of south
Main gable of Waionaku sugar mill	23 31.2 west of north
Extreme point of headland at the left of Hilo Bay, seen at the horizon	0 41.1 east of north

Ka Lae, Hawaii Island.—The station of 1906 was reoccupied as nearly as could be determined. It is at the extreme south point of Hawaii Island near the lighthouse. It was reached by an 18-mile drive from Waiohinu. The station is marked by a pine stake, octagonal in shape, about 2 inches in diameter and 16 inches long, driven almost flush with the ground. It is distant 107.7 feet from the nearest corner of the building used for quarters for the lighthouse keeper, in line between the triangulation stations Ka Lae and Palahemo (both permanently marked), and is 31.0 feet from the center (27.0 feet from the edge) of the monument marking Ka Lae. It is 26.8 feet from the center of the concrete foundation of the old latitude pier, and 62.6 feet from a cross mark on a large stone firmly embedded in the ground near the fence. This cross mark is 43.2 feet northwest of the northwest edge of Ka Lae triangulation monument. The following true bearings were determined:

	° ′
Pole on Palahemo triangulation station (mark)	54 36.5 east of north
Left edge of vertical post of lighthouse	12 46.1 west of south

Kapoho, Hawaii Island.—The station of 1906 was reoccupied. It is in the pasture north of Mr. Henry J. Lyman's house, directly in line between it and the schoolhouse, and a little less than halfway from the former. It is 39.8 feet a little north of west of a mango tree, practically the only tree in the pasture. The location can be pointed out by Mr. Lyman. The formation consists of about 6 or 8 inches of soil over solid lava rock (pahoehoe). The station was marked by a rough stone about 10 inches long and 6 inches square on top, set on the solid rock and projecting about 2 inches above the ground. A half-inch hole drilled in the stone marks the exact spot. The letters U. S. were roughly chipped on the top of the stone. The following true bearing was determined in 1906:

	° ′
Flagpole on schoolhouse	23 25.7 east of north

Kilauea, Hawaii Island.—The station of 1906 was reoccupied. It is just opposite the Volcano House, and 94.5 feet southeast of the northeast corner of the triangulation station monument. The station is marked by a wooden stake projecting about 2 inches above the ground. The following true bearings were determined:

	° ′
Uwekahuna triangulation station (mark)	72 07.2 west of south
Flagpole on the Volcano House	20 36.8 west of north
Base of weather vane support on Whitney seismic observatory	9 05.0 east of south
Middle of copper bench mark on triangulation station monument	62 27.0 west of north

HAWAII—continued.

Complete observations were also made at 7 other stations around the rim of the crater and at 10 stations near the fire pit Halemaumau, and rough declination observations were made at 7 stations near the edges of the pit.

Lahaina, Maui Island.—The station of 1900 and 1906 was reoccupied as nearly as possible. It is on the grounds of the courthouse and is north of the building, which faces southwest. It is 92 feet from the north corner of the courthouse building, 77 feet from a large iron wood tree toward the west, and 39.2 feet from a palm tree toward the north. It is also distant 20.9 feet, 17.7 feet, and 27.0 feet from three mango trees, east, south, and west from the station, respectively. The station is marked by a pine stub driven flush with the ground. The following true bearings were determined:

	° ′
North corner of courthouse	17 50.8 west of south
Gable of Lahaina Hotel	50 25.7 east of north
Extreme southern point of Island of Lanai, at horizon	53 28.6 west of south
Base of flagstaff in front of courthouse (mark)	36 33.6 west of south

Mauna Loa, Hawaii Island.—Observations were made at six stations along the eastern and southeastern rim of the crater, the walls of which drop almost perpendicularly 700 or 800 feet.

Port Allen, Kauai Island.—Observations were taken at a point between one-fourth and three-eighths of a mile nearly due north of the probable location of the old station No. 2, on the bluff perhaps 30 feet above the water and 28 feet from the edge. It is on a point where the shore line turns at an angle of 90° toward the right, looking north. It is distant 9.2 feet and 16.2 feet, respectively, from two cross marks cut in the rock, northwest and southeast from the station, and is *directly* in line between these marks. It is also 27.0 feet northeast of a similar cross in a rock. This last mark is within 3 feet of the edge of the bluff. The following true bearings were determined:

	° ′
Base of flagpole in schoolhouse yard (mark)	33 34.9 east of north
Base of flagpole of Kauai Railway Co	6 50.4 east of south

Robinson, Oahu Island.—The station is about 10 miles north of the Honolulu magnetic observatory, and is on the new sisal plantation of the Hawaiian Fiber Co. It is in the middle of the road leading north from the manager's residence and about 2,000 feet distant from the same. It is also on a line with the north edge of the fifth crossroad through the sisal fields. The mark used was an azimuth mark on the north gable end of the manager's residence, a 4-inch board, placed vertically, painted white, on a dark-green background. The station is marked by a concrete post 4 by 4 by 24 inches, set flush with the surface. A piece of brass rod one-half inch in diameter in the center of the post marks the exact spot. The following true bearings were determined:

	° ′
Azimuth mark on manager's residence (mark)	27 37.4 east of south
Azimuth mark to north	27 38.3 west of north
Left-hand edge of water tower	47 20.1 east of south
Spire of church	78 20.4 east of north

Waimea, Kauai Island.—Observations were made in front of the house occupied by Dr. Sandow, at a point in line with the west end of the house, 37.2 feet from the stone terrace and 73.2 feet from a stake said to mark the center of the Transit of Venus Pier, which is beneath the surface. The station of 1906 was 7 feet nearer to the house. As the plot of ground on which the station is located is used for a vegetable garden, the station was not marked. The following true bearing was determined:

	° ′
Base of pole on church spire (mark)	59 15.8 west of north

IDAHO.

Idaho Falls, Bonneville County.—The station is on the fairgrounds 1½ miles south of the town's center. It is between a small irrigation ditch and the lake bank. It is 290 feet east of the southeast corner of the boathouse, 10 feet south of the lake bank, 75 feet northwest of the northwest corner of a stable, 13 feet north of a tree, and 154 feet northeast of the northeast corner of the grand stand. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in the top, which projects 1 inch above the ground. The following true bearings were determined:

	° ′
Southeast corner of east cement abutment where canal enters lake (mark)	38 21.4 west of north
South gable of a house	36 03.4 west of north
Southeast corner of cement abutment at north side of outlet to lake	84 28.0 west of south
Northeast corner of top of cement pier at northeast corner of grand stand	21 12.3 west of south

MASSACHUSETTS.

Boston, Suffolk County.—The 1906 station was reoccupied. It is on Castle Island south of Fort Independence about 50 feet northwest of the station of 1905. It is 143 paces from the south entrance to the fort and 6 feet west of a direct line from the south entrance of the fort to a large tank on a distant hill to the south. It is also 142 paces from the southeast corner of the fort, 153 paces from the southwest corner, and 63 paces from a small walk, in a direct line to the south entrance. The station is marked by a limestone post 6 by 6 by 32 inches, projecting 1 inch above ground, and lettered U. S. C. & G. S., 1905. The following true bearings were determined in 1906:

	°	′	
Central flagpole on Marine Park head house (mark)	67	36.4	west of south
White spire in South Boston	81	40.6	west of south
Southwest corner of fort, above stone foundation	18	02.5	west of north
Southeast corner of fort, below top coping	38	23.5	east of north
Long Island Lighthouse	80	56.4	east of south
Spectacle Island Lighthouse	64	48.4	east of south

Fitchburg, Worcester County.—The station is in Coggswell Park, about 1 mile south of the railroad station. It is in the field just north of the Coggswell homestead, 82 feet from the east stone fence, 230 feet from the west stone fence, 205 feet from the northeast corner of a red barn, and 38 feet from a large stone 50 feet west of the fence. The station is marked by a marble post 6 by 7 by 30 inches, with top edges beveled, and projecting about 1 inch above the ground. The following true bearings were determined:

	°	′	
Flagpole on Mount Elam lookout (mark)	76	56.7	east of south
Flagpole on cupola of farmhouse on hill to east	79	11.5	east of north
Peak of roof of white house on distant hill	26	13.1	west of north
High Rock observatory on Pearl Hill	12	01.4	east of north
Chimney on Burbank Hospital	1	02.8	west of north

Georgetown, Essex County.—The station is in Union Park, on Main and Union Streets, about one-fourth mile southeast of the principal square, which is corner of Main and North Streets. It is 23 paces from center of Main Street road, 3 feet north of the line between the sixth tree north on the Main Street side of the park and the seventh tree on the Union Street side, being 14 paces from the former and 13 paces from the latter. It is also 173 paces northerly from the stone post (property marker) at the southern end of the park. The station is marked by a length of sewer pipe, with bronze marker set in same in cement. The following true bearings were determined:

	°	′	
Northeast spire of Orthodox Church steeple (mark)	44	34.4	west of north
Direction on sign post at corner of Main and North Streets	37	51.6	west of north
Northwest corner of main portion of drab house	39	02.2	east of south

Gilbertville, Worcester County.—The station is on the property of the Gilbert Manufacturing Co., just east of the high school. It is about one-half mile south of the bridge on the main street, 135 feet north of a large rock, 23 feet west from the edge of the bushes, 3 feet northeast of a line through electric-wire pole and southeast corner of high school, 210 feet west of fence line, and 92 feet south of the line of the south side of high school. The station is marked by a piece of 4-inch tile, projecting about 1 inch above the ground, and having a bronze station marker cemented in the top. The following true bearings were determined:

	°	′	
Ornament on tower of Gilbert mill (mark)	86	08.1	west of south
Congregational Church steeple	35	40.1	west of north
Southeast corner of southern chimney on yellow house farthest south	19	57.7	west of south

Northampton, Hampshire County.—The station is located on the grounds of the Smith Agricultural School, about 1¼ miles south of the town's center. It is on a small hill just west of the farm buildings, 90 feet from the south corner post of the triangular pasture surrounded by a woven-wire fence, 123 feet from west corner post of same, 117 feet from a large tree on east fence line, and 80 feet from old barbed-wire fence on north side of hill. The following true bearings were determined:

	°	′	
Catholic Church steeple (mark)	59	29.8	east of south
Nearest corner of chimney of Agricultural School	71	18.2	east of north
Black chimney, east edge near top	19	23.8	east of north
Knob on elevated red water tank	17	49.6	west of north

Middleton, Essex County.—The station is in the schoolhouse yard, in the rear of the school. It is 46 feet north-northeast to a flat rock, 46 feet east to fence, 117 feet southeast to southeast corner of fence, about 210 feet to northeast corner of school, and is 15 feet north-northeast of north side of school extended. The station is marked by a granite

MASSACHUSETTS—continued.

post, 6 by 6 by 30 inches, set flush with the ground, with a bronze magnetic station marker set in the top. The following true bearings were determined:

	° ′
Orthodox Church steeple (mark)	64 49.8 east of north
Schoolhouse cupola, center of ornament	50 52.3 west of south
Chimney (center)	32 51.0 west of north
Chimney on green house (center)	18 21.4 east of south
Northwest corner of yellow house	67 34.1 east of south

Palmer, Hampden County.—The station is on the grounds of the State hospital for epileptics, about 1 mile south of town. It is 108 feet southwest of the southwest corner of G cottage and 112 feet from the hydrant in the rear of the cottage. It is in the southwest corner of the lot reserved for the cottage, being 5 feet north of ditch on edge of plowed ground, and 9 feet east of same. The station is marked by a piece of 6-inch tile, projecting about 1 inch above the ground, and having a bronze station marker cemented in the top. The following true bearings were determined:

	° ′
Flagpole near Children's Colony Houses (mark)	77 42.1 west of south
Cupola on house of hospital farm	37 20.1 west of north
Peak of roof of white house on distant hill, just to left of main flagpole	19 55.5 east of north
Flagpole on hill above G cottage	63 43.5 east of north
Peak of roof of red barn with yellow house	31 52.6 west of south

Wakefield, Middlesex County.—The station is located in Hart's Hill Park, about three-fourths of a mile south of the Wakefield City Hall on Main Street. It is in the northeast portion of the park, on the northern projection of the main hill, about 600 feet east of the main park gate, and about 300 feet south of Charles Street. It is 93 feet southwest of a large pine tree, 76 feet south of a small birch tree, and 24 feet east-southeast from a pine tree which is about midway between two oak trees. The station mark is of granite with top cut 5 inches square, with the C. & G. S. magnetic station bronze marker set flush with the stone. The following true bearings were determined:

	° ′
Gray church steeple (mark)	23 41.8 west of north
Brick chimney	2 02.8 east of north
City Hall flagstaff	19 29.6 west of north
West edge of tower on distant hill	38 33.6 west of north

Winchendon, Worcester County.—The station is in the southwest corner of Monument Park, which is opposite the Murdock High School, lying between Murdock and Moss Avenues. It is about one-third of a mile from where Central Avenue crosses the railroad, 58 feet east of the center of Murdock Avenue, 44 feet from the southwest corner tree, 37 feet from the tree east of corner one, 27 feet from the tree north of corner one, 83 feet from Murdock High School curbing, 175 feet from southwest cannon, and 2 feet southeast of axis of same cannon. The station is marked by a granite post, 8 by 8 by 28 inches, set flush with the ground, and having a bronze magnetic station marker in the top. The following true bearings were determined:

	° ′
Northeast corner of brick foundation of gray house on Oak Street	4 34.3 west of south
Northeast corner of grammar school building	38 34.6 east of south
Methodist Church steeple	52 12.0 east of south
Southwest corner of gray foundation of Murdock High School	64 57.0 west of north
Northeast corner of northeast stone of Murdock school curbing	6 31.4 west of north

Worcester, Worcester County.—The station of 1898 was reoccupied. It is on the larger of the two small islands in the lake of the institute park, just north of the Worcester Polytechnic Institute. The point is marked with a granite post 4½ feet long, projecting 8 inches. The following true bearing was determined from the meridian line:

	° ′
Church steeple just to right of pavilion	29 49.6 east of south

A new building has been constructed between the meridian stones since 1898, but the meridian has been carefully marked by a black and white disk just above one of the windows at the southeast corner of the building.

MICHIGAN.

Athens, Calhoun County.—The station is in the southeastern corner of R. N. Wisner's pasture, which is about one-fourth of a mile northwest from the town's center, and southeast of the M. C. R. R. bridge over the creek. The station is 79.5 feet from the fence on the south border of the pasture, 52.6 feet a little east of south from a cross blazed about 1 foot above the ground on the trunk of a large maple tree, and about 204 feet from the east fence. It is marked by a

MICHIGAN—continued.

limestone post 6 by 6 by 28 inches, with a magnetic station marker set in the top, which is 3 inches above the ground. The following true bearings were determined:

	° ′
Top of Methodist Episcopal Church steeple (mark)	12 46.3 east of south
West gable of R. N. Wisner's barn	16 00.0 east of north
North gable of house next to M. C. R. R. track on east side	64 28.5 west of south

Battle Creek, Calhoun County.—The station is in the southeastern part of the grounds surrounding the Detention Hospital, about 2 miles northeast from the town's center. It is 210.8 feet from the fence on the south border of the grounds, 76.5 feet from the east property line, and 95.1 feet a little east of north from a cross cut about 1½ feet above the ground in a telephone pole. It is marked by a limestone post 6 by 6 by 27 inches, with a magnetic station marker set in the top, which is 2 inches above the ground. The following true bearings were determined:

	° ′
Top of cupola of dispensary of sanitarium (mark)	69 52.1 west of south
Base of flagstaff at top of center of main sanitarium building	64 21.3 west of south
Top of cupola with wireless telegraph attachment	79 53.8 west of south
Upper northeast corner of Detention Hospital, under eaves	61 11.5 west of north

Caledonia, Kent County.—The station is in the southwest corner of an inclosed grove on the farm of James Tolan, about 1½ miles east from the town's center, and about 1,500 feet north of James Tolan's house. It is 79 feet north of the fence on the south border of the grove, 29.4 feet a little east of south of a cross blazed about 1 foot above the ground in a tree trunk, and about 97 feet east from the worm fence on the west border of the grove. The station is marked by a limestone post 6 by 6 by 28 inches, with a magnetic station marker set in the top, which projects 3 inches above the ground. The following true bearings were determined:

	° ′
West gable of James Tolan's house (mark)	17 02.3 east of south
Top of cupola of schoolhouse	85 45.2 west of north
South gable of a barn	58 15.5 west of north
North gable of James Tolan's barn	22 35.5 east of south

Centerville, St. Joseph County.—The station is in the northeastern part of the county fairgrounds, about one-fourth mile southeast from the town's center, and about 153 feet west from the fence on the east border of the ground. It is 98.2 feet and 96.1 southwest and southeast, respectively, from the southeast and southwest corners of a barn containing horse stalls numbered 90 to 94. It is also 57.2 feet north from the fence outside the race track. The station is marked by a limestone post 6 by 6 by 26 inches, with a magnetic station marker set in the top, which projects about 2 inches above the ground. The following true bearings were determined:

	° ′
West gable of a farmhouse, about one mile distant (mark)	76 09.5 east of north
Top of water tank on a windmill	35 04.1 west of north
Lower southeast corner of the judges' stand at race track	83 54.7 west of south

Kalamazoo, Kalamazoo County.—The station of 1907 on the southern edge of the grounds of Kalamazoo College, about 1½ miles southwest of the center of the town, was reoccupied. It is about 528 feet west of Bowen Hall, 12 feet north of the edge of a steep bank down to Lovell Street, on the south side of the grounds, and about 426 feet southwest of a brick dwelling, which is the most western building on the grounds. It is marked by a Bedford limestone post 5 by 7 by 32 inches, projecting about 7 inches above the ground and lettered U. S. C. & G. S., 1907. The location of the stone is known to the college authorities. The following true bearings were determined in 1910:

	° ′
Rod on highest cupola of Michigan asylum (mark)	4 59.8 west of south
Center of top of large tower at the asylum	10 41.3 west of south
Flagstaff on private sanitarium	33 39.8 east of south
Flagstaff on normal school	52 35.1 east of south

Lowell, Kent County.—The station is in the southern part of the infield of the town race track, about one-fourth mile south from the town's center. It is 133.5 feet north of a hedge south of the track, 254 feet east of a hedge on the west border of the ground, 111.8 feet northwest from the center of the trunk of the west maple tree of a row at the southeast corner of the infield, and 193.8 feet northeast from the northeast corner of the horse stable. The station is marked by a marble post 2 by 8 by 24 inches, lettered U. S., with a hole in the center of the top, which projects 1½ inches above the ground. The following true bearings were determined:

	° ′
Spire on cupola of schoolhouse (mark)	5 52.0 east of north
Base of cross on a church steeple	33 34.9 west of north
Top of ornament at top of south side of post office	7 28.1 east of north

MICHIGAN—continued.

Ludington, Mason County.—The station is in the northwestern part of a piece of ground belonging to the city and known as the old fairgrounds, about 1 mile northwest from the town's center. It is 204 feet east of the west fence and about 369 feet south of the north fence. It is 91.6 feet west of a cross blazed about 1 foot above the ground in the trunk of an oak tree, and 114.6 feet southwest from a cross blazed about 1½ feet above the ground in the trunk of a beech tree. The station is marked by a limestone post 6 by 6 by 30 inches, projecting 4 inches above the ground, and having a bronze magnetic station mark in the top. The following true bearings were determined:

	° ′
Top of cupola of courthouse (mark)	42 49.2 east of south
Top of cupola on high school	43 18.4 east of south
Base of cross on a church steeple	39 30.0 east of south
Base of cross on west steeple of Catholic Church	30 51.4 east of south
Spire of Lake View School	21 24.5 east of south

Mason, Ingham County.—The station is in the southeastern part of the town fairgrounds and race track, owned by L. C. Webb, about three-fourths of a mile south from the town's center. It is 74.6 feet from the fence on the south border of the ground, 153.2 feet east from the northeast corner of the grandstand, and 32 feet south from the outside edge of the race track. The station is marked by a marble post 6 by 6 by 30 inches, with a magnetic station marker set in the top, which is about 2 inches above the ground. The following true bearings were determined:

	° ′
Top of cupola of high school (mark)	5 49.0 east of north
Top of cupola of Baptist Church	7 22.5 east of north
Top of cupola of county courthouse	9 50.8 east of north
Lower west edge of town water tank	8 31.8 east of north

A north meridian point was set about 700 feet distant, across the race track. The exact spot is indicated by the point at the top of a small marble monument, which projects about 3 inches above the ground. The monument is 5 by 5 inches at the bottom and 27 inches long with a cylindrical top.

Wayland, Allegan County.—The station is in the southwest part of a pasture belonging to Charles Walsh, about three-fourths of a mile east from the town's center. The pasture is across the road from Alva Frugh's barn. The station is 108.8 feet north from the fence on the south border of the pasture, 87.8 feet southeast from the center of the trunk of an apple tree, and about 321 feet east from the worm fence on the west border of the pasture. The station is marked by a limestone post 6 by 6 by 25 inches, with a magnetic station marker set in the top, projecting 1 inch above the ground. The following true bearings were determined:

	° ′
Top of town water tank (mark)	89 46.5 west of south
Rod on cupola of a barn	72 00.3 west of south
South gable of Charles Walsh's house	79 59.4 east of south
Conical top of Charles Walsh's grain tower	76 50.3 east of south

A north meridian point was set about 600 feet distant, across a swamp. It is 15.6 feet northwest from a cross blazed about 1 foot above the ground in a tree trunk about 8 inches in diameter, and 116.6 feet east from a wire fence. It is marked by a cement post 4 by 7 by 24 inches with a cross cut in the top.

MINNESOTA.

Bethel, Anoka County.—The station is on a tract of land covered with scrub oak at the southeastern corner of the town site, about one-fourth mile southeast from the town's center. It is about 500 feet northwest from the railroad section house on the east side of the Northern Pacific Railroad track, 24.1 feet west from a cross blazed about 1 foot above the ground in the trunk of an oak tree, 249.5 feet northwest from the northwest corner of a railroad tool house on the west side of the track, and about 190 feet west from the western railroad track. The station is marked by a limestone post 6 by 6 by 30 inches, projecting 3 inches above the ground, and having in its top a bronze magnetic station mark. The following true bearings were determined:

	° ′
Base of flagstaff on cupola of schoolhouse (mark)	38 00.0 west of north
North gable of section house on east side of railroad track	59 48.5 east of south

North Branch, Chisago County.—The station is in the western part of a piece of land used as a picnic park and belonging to the Northern Pacific Railroad, on the west side of the railroad track, about 800 feet southwest from the railroad station and about one-fourth mile southwest from the town's center. It is 175 feet from the western track of the Northern Pacific Railroad, 86 feet east from the fence across the road to the west, and 162.8 feet southeast from the northeast corner of a picket fence at the intersection of the roads on the west and north sides of the ground. The

MINNESOTA—continued.

station is marked by a limestone post 6 by 6 by 30 inches, projecting about 5 inches above the ground, and having a station marker in the top. The following true bearings were determined:

	° ′
West gable of Alfred Johnson's store (mark)	30 02.5 east of north
Lower southeast corner of Northern Pacific Railroad station	22 43.8 east of north
Center of top of ornamental front piece on roof of the North Branch Manufacturing Co	34 26.0 east of north
Top of belfry on a white frame building	65 41.5 east of north

Rush City, Chisago County.—The station is in the northeastern part of the county fairgrounds, about three-fourths mile west from the town's center. It is 75.5 feet east from the outside edge of the race track, 158.5 feet south from the fence on the north border of the grounds, and 46 feet southwest from the southwest corner of the live-stock shed. It is marked by a limestone post 5 by 6 by 30 inches, projecting about 5 inches above the ground, with a bronze magnetic station mark in the top. The following true bearings were determined:

	° ′
Base of cross on Swedish Lutheran Church steeple (mark)	61 12.7 east of south
Base of cross on steeple of Church of Sacred Heart	77 23.6 east of south
Top of Swedish Baptist Church steeple	86 50.2 east of south
Base of flagstaff on grain elevator	85 42.6 east of north

Zimmerman, Sherburne County.—The station is on the south side of a low hill about one-half mile northwest from the town's center, about 800 feet northwest from the junction of two roads. It is about 198 feet northeast from the wire fence on the southwest side of the road to Elk Lake, about 232 feet west from the wire fence on the east side of the road to Princeton, and about 275 feet northwest from a sheet-iron drain pipe in the road to Princeton. The station is marked by a limestone post 6 by 6 by 32 inches, projecting about 5 inches above the ground, with a magnetic station marker set in the top. The following true bearings were determined:

	° ′
Upper northwest corner of Wooden & Man general store (mark)	41 44.3 east of south
Base of flagstaff on Magnan & Nash hardware store roof	35 59.4 east of south
Center of top of the shaft of a windmill	30 36.0 east of south

MISSOURI.

Kansas City, Jackson County.—The station of 1900 was reoccupied. It was found to be no longer suitable for magnetic observations on account of the proximity of a high-powered electric railway, and a new station was therefore established on a low hill in the northern part of Swope Park, about 5 miles southeast from the town's center. It is about 350 feet north from the Missouri Pacific Railroad tracks, 358.5 feet east from the southeast corner of the stone wall above the bear cages, and 98 feet southwest from the center of the trunk of an oak tree. The station is marked by a marble post 6 by 6 by 33 inches, projecting about 6 inches above the ground and lettered U. S. C. & G. S., with a small hole in the center to indicate the exact spot. The following true bearings were determined:

	° ′
Top of west tower of golf clubhouse (mark)	82 02.7 west of north
Top of east tower of golf clubhouse	80 37.5 west of north
Lower west edge of chimney on lion house	75 59.2 west of north
Center of top of tower on conservatory building	48 09.1 west of south

MONTANA.

Butte, Silverbow County.—The station is near the southwest corner of the Mount Moriah Cemetery, about 1½ miles south and one-half mile west of the town's center. It is between block P and block R and just southwest of lot 434 of block P. It is 89 feet north of the south cemetery fence, 48 feet east of the west fence, and 101 feet northeast of the southwest corner. The station is marked by a granite post 8 by 8 by 20 inches, with a brass plate in the top which projects 1 inch above the surface. The following true bearings were determined:

	° ′
Left edge of upper part of high cement smokestack (mark)	26 06.2 east of north
Apex of tombstone in line with brick smokestack	35 44.8 east of north
West gable of a barn	45 10.8 east of south
Southeast corner of main building at the School of Mines	15 41.0 west of north
Church spire projecting above horizon	11 26.5 east of north

MONTANA continued.

Helena, Lewis and Clark County.—The station of 1904 was reoccupied. It is near St. Joseph Catholic Orphan Asylum, about 1 mile north of the city limits. It is 453 feet east of the inner edge of Montana Avenue extended, 78 feet north of the plank fence around the asylum grounds, and 250 feet northeast of the northeast corner of the east asylum building. It is marked by a granite slab 6 by 6 by 24 inches, with a drill hole in its top, projecting 3 inches above ground. The following true bearings were determined in 1910 and 1914:

	° ′
Apex of right-hand water tank (N. P. R. R.) (mark)	14 22.6 east of south
West iron smokestack at N. P. roundhouse	17 10.8 east of south
Right edge (about middle) of brick smokestack at sewer crematory	83 30.1 east of north
Chimney on north building at poor farm	73 02.4 west of north
Right edge of elevated tank at farmhouse	6 07.6 west of north

NEBRASKA.

Beaver City, Furnas County.—The station is on the county fair grounds, one-half mile south of town's center. It is 28 feet south of the south side of the race course, 70 feet east of the southeast corner of the grand stand and in line with its south side, 32 feet northeast of a box elder tree, and 34 feet northwest of an ash tree. The station is marked by a Bedford post 6 by 6 by 20 inches with a brass plate in top, set flush with the ground. The following true bearings were determined:

	° ′
Apex of church spire (mark)	0 24.1 east of north
South gable of the Linn elevator	8 58.2 east of north
South gable of a house on brow of hill	21 16.6 east of north
Northeast corner of brick water plant	48 01.2 west of north
Spire on railroad water tank	7 06.8 west of north

Lincoln, Lancaster County.—The station of 1911 was reoccupied. It is on the campus of the State University Agricultural School, about 2 miles northeast of the town's center. It is between the roads, just northeast of the Home Economics building. It is marked by a Bedford limestone post 8 by 8 by 36 inches, with a brass plate in the top. The stone projects about 6 inches above the ground. The following true bearings were determined:

	° ′
Southeast corner of Agricultural Hall, just above base stone (mark)	12 30.1 west of south
Southwest corner of Plant Industry building	29 01.0 east of south
Northeast corner of base stone of Home Economics building	75 42.2 west of south

A similar stone 494 feet to the south marks the true meridian.

Trenton, Hitchcock County.—The station is on the county fair grounds about three-fourths of a mile west of the town's center. It is on the brow of the hill west of the race track, 130 feet west of the fence around the track, 61 feet northwest of the northwest corner of a barn, 112 feet northwest of a pump, and 95 feet east of a large cottonwood tree. The station is marked by a Bedford limestone post 6 by 6 by 20 inches with a brass plate in the top, set flush with the ground. The following true bearings were determined:

	° ′
Left edge of stand pipe on hill (mark)	50 07.4 east of north
South gable of grain elevator	64 37.2 east of north
Northwest corner of brick school building	76 23.5 east of north
Congregational Church spire	87 16.2 east of north
West gable of ice house	0 15.9 east of north

NEW HAMPSHIRE.

Auburn, Rockingham County.—The station is on the property of W. H. Griffin, about one-fifth of a mile northeast of the post office. It is in the pasture lot just west of his house, 31 feet from the stone fence on the west of the lot, 90 feet from the south boundary fence, 47 feet northwest of a large rock which projects about 3 feet above the ground, and 12 feet southwest of the center of three large flat rocks, which are about 40 feet east of the above-mentioned stone fence. The station is marked by a bronze marker set flush in a flat dark gray rock. The following true bearings were determined:

	° ′
Northeast spire of church steeple (mark)	45 09.2 east of south
Weather vane on cupola of white barn	36 38.7 east of north
Peak of roof on white house with two chimneys on hill south of lake	20 13.0 east of south
North corner of white house on eastern hill	78 03.8 east of south

NEW HAMPSHIRE continued.

Dover, Strafford County.—The station is on the city farm property, about one-half mile east of the City Hall, across the Cocheco River. It is in the southeast corner of the property, about 200 feet southeast of the city barns; 80 feet northeast of a small elm tree on fence line, 70 feet, perpendicularly, from the sixth fence post from the corner, and 50 feet from the east boundary line. The station is marked by a marble stone, 4 inches square and projecting 1 inch above the surface of the ground, and having a bronze station marker in the top. The following true bearings were determined:

	°	′	
Garrison Hill Observatory (mark)	2	32.7	west of north
Church steeple with wind vane	27	12.9	west of north
City Hall	89	52.0	west of south
Church steeple	55	18.8	west of south
Center of ornament on jail roof	39	12.0	east of north

Exeter, Rockingham County.—The station is on the campus of the Tuck High School, about three-fourths mile west of the City Hall. It is 60 paces south of the center of the north cinder track, 22 paces north of the south cinder track, 58 paces west from the home plate of the baseball diamond, 183 feet southwest of the southwest corner of the high-school building, 39 feet west of the west line of the high-school lot, and 290 feet south from the end of the fence. The station is marked by a roughly squared stone about 5 inches square set flush with the ground and having a bronze marker set in the top. The following true bearings were determined:

	°	′	
Southeast corner of Tuck High School (mark)	7	34.0	west of north
Spire on high school	12	58.4	west of north
Southeast corner of white house, visible through woods	44	43.8	east of south
Northern corner of chimney on yellow house with red trimmings	59	31.7	east of north

Manchester, Hillsboro County.—The station was established in Derryfield Park, 1¼ miles east northeast of the northern bridge across the Merrimac River and 2¼ miles from Rock Rimmon, a little north of east. It is 540 feet west of the Weston Observatory and 150 feet west of the center of the two cannons. It is on the western edge of the rock ledge about 40 feet from the south edge and 20 feet from the west edge, and approximately in line with the Weston Observatory and the City Hall. The station is marked by a bronze station marker set in the solid ledge. The following true bearings were determined:

	°	′	
City Hall spire (mark)	60	11.6	west of south
Iron bolt set in stone east of door of Weston Observatory	62	49.2	east of north
Gatehouse knob	61	35.4	east of south
Church spire with wind vane	37	57.6	west of south
Yellow tower with clock	69	55.8	west of north

Milford, Hillsboro County.—The station is on the campus of the Milford High School, about one-fifth of a mile west of the town hall. It is 240 feet from the northwest corner of the high school, 305 feet from the northeast corner, about 16 feet from the edge of the bluff, 195 feet from the easternmost pine tree, 265 feet from the home plate of the baseball diamond, and 2 feet west of the line of the western boundary of the high-school lot. The station is marked by a rough granite post 6 by 6 by 30 inches projecting 1 inch above the ground with a bronze marker in the top. The following true bearings were determined:

	°	′	
Baptist Church steeple (mark)	46	40.0	east of south
Town hall spire	72	05.4	east of south
Barn cupola across the river	2	32.8	west of north
Cupola on house west of Endicott Inn	29	19.3	west of south
Schoolhouse flagstaff	17	09.5	east of south

Peterboro, Hillsboro County.—The station is on the property of M. E. W. Jones, the local surveyor, about three-eighths of a mile northwest of the railroad station. It is on Vine Street across the street from the high school, in the northern part of the lot back of Mr. Jones's residence. It is 15 feet from the northern stone fence, 82 feet from the eastern stone fence, 230 feet from the western stone fence, and 385 feet north from a very large rock which is south of the center of the lot. The station is marked by a flat rock, projecting very little above the ground, having a bronze station marker set in the top. The following true bearings were determined:

	°	′	
High-school flagstaff (mark)	18	31.2	east of south
Southern edge of southern chimney on Schofield's white house	81	44.5	east of south
Monument on north pinnacle of Peek Monadnock	85	36.1	east of north
Northwest corner of red brick house on distant hill	1	58.6	east of south
Cupola on barn	78	17.9	west of south

NEW JERSEY.

Beverly, Burlington County.—Observations were made in a pasture belonging to Mr. John Stuart, located 2 miles southeast of the railroad station, on the northeast side of the highway to Charlestown, about one-half mile beyond where it crosses the Burlington Pike. The point at which observations were made is about 300 feet from the highway, about 200 feet from a lane on the southeast side of the pasture, and about 60 feet from a ditch inside the pasture. It is 73 feet from the wire fence on the northeast side of the pasture and in line with another wire fence leading northeast from the former one outside of the pasture. The point is marked with a 2-foot length of 4-inch terra-cotta pipe, buried with its bell end about one-half inch above the ground and having the magnetic station mark bedded in neat Portland cement filling the bell end. The following true bearings were determined:

	° ′
Northeast gable of frame house about 700 feet away (mark)	66 09.7 west of north
West gable of shingle house, about 1,200 feet away	72 44.0 east of north
Cupola of barn across road, about 500 feet away	33 51.8 west of south

Dolbow's Landing, Salem County.—Observations were made about 1 mile northwest of Perkintown in a pasture on the north (or northeast) side of the road leading to Dolbow's Landing, at a point about 250 feet from the edge of the Delaware River and 90 feet from the road.

Haddonfield, Camden County.—Observations were made at a point about three-fourths mile north of the railroad station in a pasture belonging to Mr. George Munn, on the east side of the highway to Moorestown and just north of Cooper's Creek. The point is about 500 feet east (or southeast) of the highway, about 200 feet south of Mr. Munn's house, about 250 feet southwest of the barn, 165 feet west of an apple tree 18 inches in diameter, and 84 feet south of the southwesternmost of a group of locust trees, the tree in question being 10 inches in diameter and standing in line with some fence posts. The point is marked by a concrete post 5 by 5 by 20 inches, projecting 1 inch above the ground, and having a bronze magnetic station mark in the top. The following true bearings were determined:

	° ′
Peak of silo about 900 feet away (mark)	67 19.3 east of south
East edge of top of water tower	68 16.9 west of south
Nearest edge of top of nearest chimney of house 1,000 feet away	58 25.1 east of south

Merchantville, Camden County.—Observations were made at a point about 2 miles east of the railroad station and about one-half mile northeast of the Arlington Cemetery, on the northwest side of the Burlington Pike. The point is in a peach orchard belonging to Mr. Horner, just southwest of another one belonging to Mr. Collins. It is 110 feet from a railing at the side of the pike, 93 feet northeast of a wild cherry tree 18 inches in diameter, 25 feet east of a ditch, and 38 feet from the peach tree at the west end of the first row. The point is on some low ground not planted with trees and is marked by a 2-foot length of 4-inch terra cotta pipe, having its bell end filled with Portland cement, in which the regular magnetic station mark is bedded. It is set with the bell end about one-half inch below the level of the ground. The following true bearings were determined:

	° ′
Highest point of house about 800 feet away (mark)	57 27.0 west of south
West gable of house 600 feet away	28 40.4 east of south
South gable of highest barn next to above house	35 52.5 east of south

Nortonville, Gloucester County.—Observations were made in a meadow near the Delaware River, reclaimed from tidal overflow by dikes, at a point about one-fourth mile back from the river. The point is about one-third mile from the main highway connecting Pennsgrove with Bridgeport, and is reached by an improved road having a telephone line next to it and leaving the main highway just opposite where it is joined by a macadamized road from Center Square Station. The point is about 100 feet northwest of a cottage inhabited by colored people, 50 feet north of a ditch, and 50 feet west of another ditch.

Pennsgrove (Station No. 1), Salem County.—Observations were made in a field about 3 miles south of the center of town, on the east side of the road to Salem, it being the second field south of a place where a road leading to Pedricktown branches off; at a point 100 feet east of the west fence of the field, and 100 feet north of the south fence.

Pennsgrove (Station No. 2), Salem County.—Observations were made about 1 mile south of the center of town, in an unfenced field just beyond a schoolhouse where a road forks off on the east side of the road to Salem. The point at which the observations were made is about 150 feet southeast of the schoolhouse, about 200 feet east of the road to Salem, and about 80 feet southwest of the road which forks off from it.

Repaupo, Gloucester County.—Observations were made in a pasture belonging to Mr. J. Clark Helm, about one-half mile southeast of Repaupo Station, on the east side of the road, and nearly opposite the house with four large trees in its yard. The point at which the observations were made is about 50 feet east of the rail fence along the road, and about 100 feet north of a wire fence.

NEW YORK.

Brushton, Franklin County.—The station is in the Protestant Cemetery, about one-half mile west of town. It is in the central part of the cemetery, in the central part of a north and south narrow path, about 20 feet south of the main east and west path. It is 5.8 feet southwest from the Robert Earl monument, 17.7 feet northwest from the Asa J. Wilson monument, 13.8 feet northeast from the Frank J. Eldred monument, and 16.2 feet southeast from the Hugh Burgess monument. The following true bearings were determined:

	° ′
West gable of old barn (mark)	74 36.8 east of south
West gable of yellow barn	3 35.0 east of north
South gable of unpainted house	25 45.5 west of north
Northeast corner of white house with green trimmings	67 59.9 west of south

Burke, Franklin County.—The station is located on the school grounds just back of the school building, and about 200 yards northeast of the village center. It is about equally distant from the two side fences and the rear fence, 121.6 feet from northwest corner of school building, 128 feet from northeast corner of school building, 68.9 feet from northwest corner post of fence, and 69.3 feet from northeast corner post of fence. The station is marked by a 4-inch tile, projecting one-half inch above the ground, having cemented in the top a bronze magnetic station marker. The following true bearings were determined:

	° ′
North gable of church (mark)	50 14.2 west of south
Southwest gable on distant farmhouse	81 36.7 east of north
East gable on tan-colored house	44 14.7 west of north
North gable on cream-colored house	40 48.2 east of south

Mineville, Essex County.—The station is about three-fourths mile south of the post office, just south of the Westport road and east of the Moriah Center road, about 100 yards southeast of the house of A. W. Chappell. It is 36 feet east of a large rock near a pile of stones, 66 feet west of a small apple tree which is between three others and about 60 feet from them, 79 feet southwest of a very bushy apple tree, and 111 feet northwest of a cherry tree with a rock near its roots. The station is marked by a bronze magnetic station mark set flush in a dark gray flat rock, about 3 by 2 feet. The following true bearings were determined:

	° ′
Church steeple in Mineville (mark)	17 52.4 west of north
East gable of olive-colored house	74 27.2 west of north
North gable of large yellow barn	28 06.6 west of south
Silo in Moriah Center	6 17.6 east of south
South gable of small yellow house	2 19.7 east of north

Morrisonville, Clinton County.—The station is on the high-school grounds, one-fifth of a mile east of the village center. It is near the north corner, about 30 feet from the sidewalks on each street, 92.3 feet north of the north corner of high school, 60.2 feet north of a lamp-post, 41.3 feet from an elm tree north of sidewalk, and 127.3 feet from a large maple tree. The station is marked by a concrete post, about 6 inches square, set flush with the ground, and having a bronze magnetic station marker in the top. The following true bearings were determined:

	° ′
East gable of yellow house (mark)	78 05.6 west of south
Southeast corner of red store	22 18.4 west of north
Northwest corner of light brown store	86 59.1 east of south
Southwest corner of old unpainted house	45 54.8 east of south

North Lawrence, St. Lawrence County.—The station is on the local school grounds, in the northwest part of the village. It is 34 feet from an electric light pole in direct line with northwest corner of the shed in the rear of the school, 97 feet from said corner, 57 feet from rock by cedar hedge, and 99 feet from northwest corner of school. The station is marked by a 4-inch tile, set flush with the ground, with a bronze magnetic station marker cemented in the top. The following true bearings were determined:

	° ′
North gable of gray barn (mark)	29 03.4 east of south
North gable of white house with green trimmings	46 20.5 west of south
North gable of sugarhouse	34 08.8 west of north
Southwest corner of red barn	76 18.8 east of north
North gable of red house	73 51.2 east of south

Ogdensburg, St. Lawrence County.—The station is on the grounds of the State Hospital for the Insane, in the eastern part of the city corporation, about 3½ miles east of the mouth of the Oswegatchie River, and 100 yards south of the St. Lawrence River. It is southwest of the superintendent's dwelling and north of the extreme west wing of the main

NEW YORK—continued.

building. It is 38 feet south of center of roadway, 168 feet northwest of square corner of building, 46.4 feet from a small maple tree, and 81.8 feet from a hard maple tree. The following true bearings were determined:

	° ′
Spire on church across the river (mark)	32 41.3 west of north
Electric light pole north of dark gray stone building	42 16.1 east of north
East gable on green house	24 22.2 west of south
The easternmost of two south gables on orange-yellow house across the river	87 04.1 west of south
South gable on yellow house across the river	59 05.2 west of north

Plattsburg, Clinton County.—The station of 1905 and 1907, in the target-practice grounds of the Army post, was reoccupied. It is in line with the row of posts marking the 300-yard range and is 165 feet from post No. 8. The station is 215 feet southeast of the road along the side of the grounds. The station is marked by a marble post 6 by 6 by 30 inches, lettered U. S. C. & G. S., 1905. The following true bearings were determined:

	° ′
West gable of south end of band quarters (mark)	44 20.3 east of north
South gable of old house	51 42.9 west of north
Main flagpole	24 39.5 east of north

Port Henry, Essex County.—Observations were made on the country-club grounds, about three-fourths of a mile west of the lake shore and about 250 yards south of the Mineville road. The station is about 140 feet east of the stable and toboggan slide, about 300 feet east-southeast of the country club, 40 feet west of the edge of the brush, 110 feet south of the east end of the bunker in the golf course. The station is marked by the letters U. S. C. & G. S., 1913, cut in a dark gray rock. The rock is just south of two others about the same size and about 15 feet south of the exposed rock ledge. The following true bearings were determined:

	° ′
South gable of white house (mark)	50 10.5 west of north
South gable of old unpainted house	10 12.4 east of north
Church steeple in Moriah	88 23.5 west of north
North gable of red house	21 45.6 west of south

Whitehall, Washington County.—The station is located on the property of the armory of Company I, Second Regiment, New York National Guard, in the west section of the village. It is 135.5 feet northeast of northeast corner of armory, 113 feet from east elm tree near south fence, 160.4 feet from southeast fence corner, 136.6 feet from northeast fence corner, and 101.7 feet from elm tree near north fence. The lot is surrounded by an iron fence, made by iron rods set vertically. The station is marked by a 4-inch tile, set flush with the ground, with a brass magnetic station mark cemented in the top. The following true bearings were determined:

	° ′
Catholic Church steeple (mark)	34 56.6 west of north
Flagstaff on armory	87 28.4 west of south
North gable of dark red barn	13 57.8 west of south
West gable of white house	73 04.1 east of south
East high gable of dark red house	63 34.0 west of north

NORTH CAROLINA.

Enfield, Halifax County.—Observations were made at a point about three-fourths mile north of town, on property belonging to Mr. L. B. Mann located just south of the cemetery for colored people and just west of the Atlantic Coast Line tracks. The point is 58 feet east, approximately, from the east side of a road which passes west of the cemetery, and is 85 feet south, approximately, from the south fence of the cemetery. It is marked by a 2-foot length of 6-inch draintile, projecting about 3 inches above the ground, and having a brass magnetic station marker cemented in the top. The following true bearings were determined:

	° ′
West side of top of smokestack one-half mile away (mark)	25 19.4 west of south
Northeast gable of house about 600 feet away	1 00.5 east of north
Center of windmill, 700 feet away	31 35.5 east of north

Franklinton, Franklin County.—Observations were made at a point about one-half mile north of the center of town, on property belonging to Mr. Ed Morris, near the northwest corner of the grounds of the graded school. The point is 158 feet north of the northwest corner of the school building, 27 feet east-northeast of a young cherry tree, 9 feet high with two forks, and about 280 feet west of the west edge of the highway. It is marked by a piece of terra-cotta flue pipe 2½ feet long and 6 inches in diameter, set with its bell end 6 inches above the ground, and having the upper end filled with cement, in which the brass magnetic station marker is set. The following true bearings were determined:

	° ′
Steeple of Baptist Church (mark)	29 39.7 west of south
East gable of white house about 800 feet away	52 07.7 west of south
Southwest gable of house visible over hilltop, about 1,000 feet away	58 53.4 east of south

NORTH CAROLINA—continued.

Littleton, Halifax County.—Observations were made at a point about 1 mile south of the center of town. The point is located in a pasture belonging to Mr. John Leach, reached by the main highway to Panacea Springs. It is about 800 feet northeast of the Leach mansion, 57 feet west of the east fence of the pasture, 97 feet north of a tree about 3 feet in diameter which leans to the south about 20 degrees from vertical, and 140 feet east-southeast of an oak tree 3½ feet in diameter. The station is marked by a 2-foot length of 4-inch draintile, set with its bell end about 3 inches above the ground. The following true bearings were determined:

	° ′
North gable of house or shed about one-fourth mile away (mark)	69 50.0 east of south
East gable of barn about 500 feet away	7 16.0 east of south
Northeast corner post of fence around Leach mansion	56 03.1 west of south
East gable of barn about 1,000 feet away	78 16.5 west of north

Raleigh, Wake County.—The station of 1906 was reoccupied. It is on the fairgrounds about one-fourth mile from the nearest trolley line and about 2 miles from the center of Raleigh past the Agricultural and Mechanical College property and fairgrounds. The station is 78.1 feet from the nearest corner of the house occupied by Mr. Ross, 46.5 feet east of the west fence on the fairground property, 84 feet south of a fence running east and west, and about 250 feet north of the highway. It is marked by a marble post 6 inches square, projecting about 2 inches above the ground and lettered C. & G. S. The following true bearings were determined:

	° ′
Northeast edge of cross on Catholic Church	1 17.7 west of south
Northwest edge of chimney on end of Catholic Orphanage	13 12.8 east of south
Spire on glass turret of hospital	32 39.8 east of south
Top of water tank next to Experiment Station building	40 04.1 east of south
Top of floral building on fairgrounds, center of base of flagpole	68 07.9 east of south

Scotland Neck, Halifax County.—Observations were made at a point about one-fourth mile northeast of the railroad station, in the southeastern part of the race-track grounds and northeastern part of the baseball grounds, situated inside of the running track. The point is about 49 feet west of the inside edge of the track, and about 31 feet south of the south edge of a road running across the space inside the track, and separating the baseball grounds from the rest. The grounds belong to the Kitchin estate. The point is marked with a 2-foot length of 6-inch drain tile, set with its bell end even with the ground; the bell end is filled with Portland cement, in which there is a magnetic station mark. The following true bearings were determined:

	° ′
Water tank about 2,000 feet away (mark)	29 36.0 west of north
Water tank about 1,000 feet away	34 04.9 west of south
Steeple of church	72 43.6 west of south
Steeple of church	88 16.2 west of north
Steeple of Episcopal Church	80 14.6 west of north

Wake Forest, Wake County.—Observations were made at a point in the grounds of a country schoolhouse about 2 miles south of Wake Forest and about 1 mile south of Forestville, reached by the main highway to Raleigh, and on the east side of the highway. The point is about 170 feet from the east edge of the highway, about 65 feet from the (unmarked) northeast boundary of the school property, 96.5 feet east of the east corner of the school building, 175 feet southeast of the northernmost of a set of guy poles of the telephone line, and is in line with a north and south stretch of the highway just before reaching the school. The station is marked with a 2-foot length of terra cotta flue pipe set with its bell end even with the ground, the upper end filled with Portland cement and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′
South upper gable of barn about 800 feet away (mark)	23 17.8 west of north
Southwest edge of stone chimney about 1,000 feet away	35 24.8 west of north
East gable of house about 800 feet away	51 45.1 west of south
Rope in well about 1,200 feet away	31 33.0 west of south

Whitakers, Edgecombe County. Observations were made at a point about one-fourth mile southwest of town in the northwest part of the grounds of the graded school. The point is 120 feet northwest of the northwest corner of the school building, 50 feet east of the west boundary of the grounds, and 49 feet south of the north boundary. It is marked by a 2-foot length of 4-inch drain tile, set with its bell end even with the ground and having a brass magnetic station marker cemented in the top. The following true bearings were determined:

	° ′
Center of ball on church steeple	82 31.2 east of north
South gable of small unpainted house against woods one-fourth mile away	78 07.5 west of north
West edge of top of chimney of two-room house about 1,000 feet away	10 52.7 east of north

OHIO.

Alliance, Stark County.—The station is in the eastern part of the estate of Col. Morgan, about 1½ miles southwest from the town's center. It is on the west side of South Union Avenue, about 700 feet east of Col. Morgan's house and is near the northwest corner of the central pond on the estate. It is about 200 feet west of South Union Avenue, 147.4 feet south from the nearest point of the northern stone post at the southwest corner of the central pond, and 38.9 feet southwest from the southwest corner of the stone dam at the northwest corner of the central pond. The station is marked by a marble post 27 by 6 by 6 inches, sunk flush with the ground and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′	
Cross on steeple of Catholic Church (mark)	34 11.7	east of north
Base of flagpole on central cupola of Col. Morgan's house	86 14.2	west of south
Base of flagstaff on northeast tower of Col. Morgan's house	89 22.0	west of north

Lodi, Medina County.—The station is in a field about 1 mile northeast from the town's center. It is on the west side of the Medina road, half way between the houses of L. C. Prouty and Le Roy Ellis. It is about 500 feet north from the south boundary of the field, 270 feet west from the east boundary, 91.9 feet northwest from a cross blazed about 1½ feet above the ground in a large oak tree, and 119 feet from a cross blazed 1 foot above the ground in a large lone tree in a hollow. The station is marked by a marble post 27 by 6 by 6 inches, with a magnetic station marker set in the top, and projecting about 2 inches above the ground. The following true bearings were determined:

	° ′	
Top of Methodist Church steeple (mark)	38 08.6	west of south
Spire on cupola of Old Ladies' Home	40 49.9	west of south
West gable of L. C. Prouty's house	32 26.4	west of south

Toledo, Lucas County.—The station of 1910 was reoccupied. It is on the Harbor View Beach grounds (old Shepard farm) near the boundary line separating it from the Case farm, about 5½ miles northeast of the center of the city. It is on the shore of Maumee Bay, 60.7 feet slightly west of south from an iron stake 1½ inches square, 6 inches above ground, which marks an old triangulation station. The magnetic station is in line with the west wall of a dancing pavilion, 115.8 feet north from the northwest corner of the concrete foundation, and 130.6 feet from the northeast corner of the foundation, 61.1 feet being the distance from the northwest corner to the northeast corner of the foundation. It is marked by a pine stake 2 by 2 by 15 inches, driven flush with the ground. The following true bearings were determined:

	° ′	
West gable of farmhouse (slate roof) (mark)	50 11.2	east of south
East gable of a farmhouse	38 22.0	west of south
West gable on the barn immediately east of the house with slate roof	52 48.7	east of south

PENNSYLVANIA.

Albion, Erie County.—The station is in the southern part of O. S. Coffin's pasture about 1 mile northeast from the town's center, where the road running north and south along the west side of the Bessemer & Lake Erie Railroad track turns at right angles to the west. It is about 300 feet east of the fence on the west side of the pasture, 55.7 feet north of the fence on the south side, 82 feet northeast from a cross blazed in a large tree, and 77 feet a little south of west from a cross blazed in another large tree, the blazed crosses being about 1 foot from the ground. The station is marked by a marble post 27 by 6 by 6 inches, projecting about 3 inches above the ground, with a brass magnetic station marker in the top. The following true bearings were determined:

	° ′	
Upper west edge of water tank of B. & L. E. R. R. (mark)	5 19.6	west of south
South gable of O. S. Coffin's barn	12 11.0	east of north
South gable of O. S. Coffin's house	19 16.2	east of north

Chadds Ford Junction, Delaware County.—Observations were made in a field just north of the town, on the east side of Brandywine Creek, about one-half mile northeast of the railroad station. The point is about 1,000 feet east of the bank of the creek, about 80 feet north of a ditch, about 50 feet west of a fence with a row of large maple trees along it, and about 300 feet north of a barn.

Corry, Erie County.—The station is in the southeastern part of the infield of the race track of the Corry Fair and Driving Park, about 1½ miles northeast from the town's center. It is 39.5 feet from the fence inside the race track to the east and 332 feet from the inside fence to the south. The station is marked by a marble post 24 by 5 by 5 inches, projecting about 3 inches above the ground, with a brass magnetic station marker in the top. The following true bearings were determined:

	° ′	
Top of steeple of Episcopal Church (mark)	15 13.0	west of south
Top of steeple of Catholic Church	19 55.1	west of south
Top of a belfry	10 51.2	west of south
Top of steeple of a small wooden church	35 10.4	west of south

PENNSYLVANIA—continued.

Cossart, Chester County.—Observations were made at a point about one-third mile northwest and uphill from Cossart Station. The point is in a field, and is about 600 feet west of Brandywine Creek, about 80 feet northeast of the macadamized highway, about 400 feet north from a large stone house, and about 500 feet from a railroad water tank.

Franklin, Venango County.—The station of 1902 (Rocky Grove) was reoccupied. It is in the Franklin Cemetery, between lots 15 and 17, section S, and is about 1 mile northeast from the town's center. It is 3 feet from the southwest corner of lot 17 and 2.8 feet from the southeast corner of lot 16. The station is marked by a blue marble stone, 5¾ inches square at the top and lettered U. S. C. & G. S., 1902. The stone projects 1½ inches above the ground. The following true bearings were determined in 1902:

	° ′
North gable of H. F. James's residence	84 16.5 east of north
Southeast corner of hospital	37 53.3 west of south
East gable of F. Mitchell's vault	28 14.5 east of south

Meadville, Crawford County.—The station of 1910 was reoccupied. As a test indicated the presence of local disturbance, a new station was established at the fair grounds, about 3½ miles to the northwest. It is in the northwest corner of the old fair grounds, about 1½ miles northwest from the town's center, 18 feet south of a large oak tree, and about 158 feet east from the fence on the west boundary of the ground. The station is marked by a marble post 42 by 6 by 6 inches, projecting 12 inches above the ground, and lettered U. S. C. & G. S., 1902. The following true bearings were determined:

	° ′
Top of First Presbyterian Church steeple (mark)	36 00.4 east of south
Base of flagstaff on the roof of the ale brewery	44 39.2 east of south
West gable of grandstand at fair grounds	16 11.4 east of south
South meridian point	00 00.5 west of south

A cement post 30 by 6 by 6 inches, projecting about 2 inches above the ground, with a brass rod in the center of the top, was set about 850 feet south of the magnetic station to indicate a meridian line.

Titusville, Crawford County. The station is in the northeast corner of the fair grounds, about 2 miles west from the town's center. It is 135.9 feet a little north of east from the southeast corner of the stone steps on the committee stand, 106.6 feet south from the row of horse stalls on the north, and about 444 feet north from the outside fence surrounding the race track. It is marked by a sandstone post 30 by 6 by 6 inches, projecting about 7 inches above the ground and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′
Lower east edge of smokestack of city waterworks (mark)	7 31.3 east of south
Northwest corner of west upper beam of iron bridge	43 14.2 west of south
Base of flagstaff on building at east gate	58 38.1 east of south
Point at top of roof of octagonal exhibition building	67 59.2 west of south

Tunkhannock, Wyoming County.—The station of 1907 was reoccupied. It is in Sunnyside Cemetery, on a piece of reserve ground at the center of the cemetery, 22.3 feet southeast from the Kunzman monument, 30.4 feet east of the northeast corner of the base of the Billings monument, and 15.3 feet west of the small Walter monument. It is marked by a St. Lawrence marble post 6 by 6 inches, projecting about 1 inch, and lettered U. S. C. & G. S., 1902.

Observations were made at a new station. It is in the southwest corner of a field belonging to H. F. Metcalf, about one-half mile north of the town's center. It is in the second field west of the west end of Avery Street, 4 feet north of the south stone wall of the field, and 54 feet east of the west stone wall. The station is marked by a stone post 30 by 8 by 5 inches, lettered C. & G. S. Meridian Mark, 1907, and projects about 6 inches above the ground. The following true bearings were determined:

	° ′
South meridian stone (mark)	0 00.0 west of south
Top of cupola on schoolhouse	13 09.5 east of south
Top of Methodist Church steeple	2 43.2 east of south

The south end of the meridian line is at the north end of Putnam Street near the edge of a steep bank. It is marked by a stone 30 by 6 by 6 inches, projecting about 8 inches above the ground with a hole in the center. The north end of the meridian line is an iron stake about 24 inches high cemented in a ledge of rock immediately west of a double tree in a field belonging to Benjamin Brown. It is painted in alternate strips of white and red. The meridian line is about one-half mile long.

PHILIPPINE ISLANDS.

Albay, Luzon.—The station is in the northwestern corner of the plaza which forms a part of the grounds of the Provincial Building, and is about in the town's center. This plaza lies between the Provincial Building on the east, the Treasury on the west, the Constabulary Offices on the south, and the high school on the north. The station is 124.4 feet a little north of west from the northwest corner of the base of the monument to Jose Maria Penaranda, 106.2

PHILIPPINE ISLANDS continued.

feet south from the southwest corner of the high school, 125.7 feet northeast from the southeast corner of the Treasury building, and 50.6 feet northwest from the nearest point on the rim of an old fountain. It is 50 feet south and 53.4 feet east from the low oval cement fence surrounding the plaza. The station is marked by a cement block 5 by 8 inches at the center, and 20 inches long, shaped to a knife edge at the top, in which there is a hole 1 inch deep to indicate the exact spot. The top of this block is buried 4 inches below the surface of the ground. The following true bearings were determined:

	° ′
Southwest corner of Provincial Building, under eaves (mark)	72 17.4 east of south
Center of base of cross on Catholic Church dome	48 59.7 west of south
Center of base of flagstaff on band stand	76 45.3 east of south

Antipolo, Luzon.—Observations were made at the magnetic observatory maintained by the Jesuits.

Atimonan, Luzon.—The old station was reoccupied. It is on a hill back of Atimonan, almost due south of the church. This hill is conspicuous as being the only one uncultivated. It is part of the first ridge back of the town and about 300 feet high. Calle Mariano Pilapil, if continued, would run to a depression in the first ridge back of the town, and the station is on the west side of this depression. The station is marked by an irregular shaped rock about 9 by 18 by 18 inches, set flush with the ground, with a drill hole in the top. The following true bearings were determined in 1907:

	° ′
Church tower, Atimonan	1 04.8 west of north
Edge of trees, Sangirin Point	2 26.8 west of north
Right (east) tangent, Baliscan Island	4 17.9 west of north

Batangas, Luzon.—The station is in the northeastern corner of the grounds surrounding the high school, about 1,300 feet east from the town's center and probably not far from the old station of 1903. It is 97.1 feet south from the fence bordering the grounds on the north, 92.7 feet east from the fence bordering the grounds on the west, 326.6 northwest from the northwest corner of the cement foundation of the Agricultural School, and 138.7 feet southwest from the southwest corner of the cement pillar supporting the southwest corner of the grand stand. It is marked by the neck of a dark glass bottle buried 8 inches below the surface of the ground. The following true bearings were determined:

	° ′
Base of cross on dome of Catholic Church (mark)	73 09.9 east of south
West gable point at top of roof of high school	86 16.1 east of north
Northeast corner of cement foundation of trade school	59 15.0 east of south

Boac, Marinduque.—The magnetic station is identical with the astronomic station. It is on the western shore of the island in the town of Lay Lay, one of the barrios of Boac, on the beach near the Boac anchorage, which is the landing place for all supplies and is about 2½ miles southwest of Boac. The station is 62 feet northeast from the west corner of the storehouse immediately northwest of the beacon and 164 feet west from the northwest corner of the schoolhouse. The surface mark is of Portland cement 30 inches long by 18 inches in diameter, with a drill hole in the top. The mark is flush with the ground and has the letters U. S. cut in the top. The subsurface mark is a similar post buried 30 inches under the ground, but not lettered. The following true bearings were determined:

	° ′
A leafless tree on hill to southeast (mark)	60 09.4 east of south
Southwest corner of sheet-iron roof of schoolhouse	75 00.7 east of south
Extreme west point of cliff on point of land to the south	1 17.2 east of south

Butuan, Mindanao.—The station is in the southeast part of the town plaza, about in the town's center. It is 101.5 feet north from the inside edge of the curb along the south side of the plaza, 62.5 feet west from the inside of the curb along the east side of the plaza, 118.4 feet northwest from the inside edge of the southeast corner of the curb surrounding the plaza, about 157 feet south of the high school, and 179 feet east of the Catholic Church. It is marked by a cement post 8 by 8 by 24 inches, set flush with the ground, and having a hole in the top to indicate the exact spot. The following true bearings were determined:

	° ′
Lower northwest corner of Provincial Government building (mark)	23 05.7 west of south
North point at top of roof of Catholic dormitory	59 06.4 west of south
East gable on Catholic Church	78 09.6 west of south
West point at top of roof of high school	4 12.1 east of north

Calapan, Mindoro.—Owing to the magnetic disturbance that existed in the vicinity of the old station, a new station was established on the northeastern edge of the main barrio of Calapan, on the beach about 85 feet above high-water mark, about 290 feet northeast from the main school building, and about 380 feet northeast from the magnetic station of

PHILIPPINE ISLANDS—continued.

1903. It is 48.2 feet from a fence corner to the northeast, 143.6 feet from a fence corner to the southwest, and about 21 feet northwest from the center of the road along the beach. The station is marked by an irregular cement post (probably an old land mark) about 5 by 5 inches at the top, and firmly fixed so that the top is about 12 inches above the ground. A cross on the top with a hole in the center indicates the exact spot. The following true bearings were determined:

	° ′
Top of beacon at steamship landing (mark)	43 08.3 west of north
Southwest gable on roof of Government storehouse at steamship landing	45 37.7 west of north
North gable on roof of central of three school buildings	71 45.7 west of south
Base of flagstaff north of school buildings	80 04.2 west of south

Calbayog, Samar.—The magnetic station of 1902 could not be reoccupied; so magnetic observations were made at the astronomic station, 67.6 feet farther east, on the sea beach a few yards south of the foot of the street on which the church fronts. Between it and the military headquarters building are a ditch and a wagon road. The station is about halfway between the ditch and the high-water line. It is 79.8 feet from the southwest corner of the headquarters building and 76.4 feet from the southeast corner of headquarters building, measured from the south side of a round post at the southeast corner of the stone addition to the building. The station is marked at the surface by an irregular piece of hard sandstone, about 18 inches long and 7 to 11 inches thick, buried so that it projects about 3 inches above the ground, with a drill hole in the top. The following true bearings were determined:

	° ′
Top of beacon at Calbayog (mark)	69 29.1 west of north
Southwest corner of convent, under eaves	56 52.5 west of north
Base of cross on central dome of church	59 59.8 east of north

Declination observations were also made at a point about 2 feet from the old magnetic station.

Observations were made also at a new station in the central part of the reservation of Camp Connell, 2 kilometers southeast from the old magnetic station and the town's center. It is 109.3 feet northeast from the nearest point on the 2-kilometer monument on the south side of the Camp Connell road, 154 feet a little west of north from the northeast corner of the front piazza of officer's quarters No. 26, 135.4 feet northeast from the northeast corner of the front piazza of officer's quarters No. 25, 134.2 feet southeast from the southeast edge of the cement tennis court. It is marked by the neck of a glass bottle buried 6 inches underground, and reinforced by three other glass bottles placed horizontally around the first with the necks set at the center. The following true bearings were determined:

	° ′
Base of flagpole	66 20.9 east of south
Upper northwest corner of building No. 38, Fifth Scout headquarters, under eaves	86 55.5 east of north
Top of hitching post across the road from officer's quarters No. 19	47 58.8 east of south
Upper northeast corner of cement carriage block in front of No. 14	50 06.0 east of south
Lower south edge of post water tank	62 21.8 west of north

Catbalogan, Samar.—The old station could not be located. A new one was established in the southeastern corner of the grounds surrounding the trade school, about one-third mile southeast from the town's center and about 800 feet southeast from the main school building. It is near the top of a small mound on which is placed a temporary shed for the agricultural students, and on which grow two small trees. It is 26.9 feet southeast from a cross blazed 2 feet above the ground in the trunk of a tree to the northwest, 9.9 feet west from a cross blazed 1 foot above the ground in the trunk of a tree to the east, and 12.1 feet from the center of the top of a tree stump to the southeast. The station is marked by the neck of a quart glass bottle buried 6 inches below the ground. The following true bearings were determined:

	° ′
Top of beacon at Catbalogan (mark)	33 49.8 west of north
Top of central cupola on the church	31 07.6 west of north
Top of belfry on southwest corner of old fort	35 04.4 west of north
Top of cupola on house immediately north of Dr. Cullen's house	29 52.3 west of north
East gable of sheet iron storehouse at trade school	25 59.0 west of north

Cebu, Cebu Island.—The old station could not be located accurately, and its probable position was found to be no longer suitable for magnetic observations, so a new station was established in the northwest corner of the Plaza at Fort San Pedro, about one-half mile southeast from the town's center. It is 189.8 feet south from the wall of the seminario across the road to the north, 166.9 feet east from the plaza fence to the west, and 215.7 feet southeast from the center of a monument marked San Rogue-Pampanga, just outside of the southwest corner of the plaza fence. The station is marked by a subsurface mark and a surface mark. The subsurface mark is the neck of a white glass quart

PHILIPPINE ISLANDS—continued.

bottle buried 1 foot underground; the surface mark is a cement block 6 by 6 by 12 inches, projecting one-half inch above the ground and lettered U. S. with a hole in the center. The following true bearings were determined:

	° ′
Top of cupola on bell tower of Cathedral (mark)	57 58.4 west of north
North gable of music stand in plaza	23 34.7 west of south
Upper northeast edge of front door of post office	20 45.6 west of south
Northeast corner of Hospital De San Jose, under eaves	20 37.6 west of north
Point of the pyramid on top center roof of the seminario	18 18.2 east of north

Cujo, Cujo Island.—The station of 1903 was reoccupied. It is on land belonging to the Bureau of Posts, to the west of the old fort, and about one-fourth mile northwest of the center of the town. It is 73.5 feet west of the southwest corner of the storehouse of the wireless-telegraph station, and 127 feet southwest from the northwest corner of the engine house. The station is marked by a large rock set level with the surface of the ground, with a drill hole in the top. The following true bearings were determined in 1903:

	° ′
Top of bell tower of church	68 54.2 east of south
Top of pavilion at boat landing	11 27.4 west of south
North gable on roof of Tribunal	26 12.1 east of south

A new station was also established 302 feet northwest from the old magnetic station, and 325 feet a little to the north of west from the northwest corner of the engine house of the wireless-telegraph station. The new station is marked by a Bureau of Lands cement post, 4 by 4 inches at the top, and projecting 2 inches above the ground, with a hole in the center to indicate the exact spot. The following true bearings were determined:

	° ′
Top of pavilion at boat landing (mark)	1 55.7 west of south
Top of bell tower of church	60 30.6 east of south
Southwest gable on roof of central school building	80 07.2 east of south

Davao, Mindanao. The station is about half a mile north of the town of Davao and about a mile from the boat landing. It is on a small hill on which the cemetery is located, on an unfenced road that is the prolongation of Magallanes Street. The station is on the east side of the road, the cemetery on the west side, about 200 feet farther on. The knoll is nicely grass covered and has a few shrubs on it. For the most part it is open. The station is almost on the highest part, about 65 feet from the traveled part of the road. The station of 1907 was marked by a cement post 5 by 6 by 18 inches, projecting about 1 inch above the ground, the top being marked with a ¾-inch drill hole and the letters U. S. 07. This marking stone could not be found, but observations were made as near to it as could be determined from the changed surroundings. The following true bearings were determined:

	° ′
South gable of a sheet-iron roof near west edge of town	53 17.8 east of south
North gable of the same sheet-iron roof near west edge of town	54 20.5 east of south
Top of northeast corner post of cemetery	74 47.6 west of south

Iligan, Mindanao Island.—The old station could not be located, but observations were made as near it as could be determined.

A new station was established in the western part of the town plaza, immediately northeast from the old fort and about in the town's center. It is 178.2 feet a little to the west of north from the northeast corner of the fort, 146.6 feet southwest from the southwest corner of the fence surrounding the municipal building, and about 46 feet east from the center of the road which runs north from the north gate of the fort. The subsurface mark is the neck of a green glass quart bottle buried 14 inches below the ground. The surface mark is a rough limestone rock about 6 by 8 by 16 inches projecting about 2 inches above the ground, and lettered U. S. with a hole in the top. The following true bearings were determined:

	° ′
Ball at top of music stand (mark)	72 01.0 east of north
Northeast corner of jail, under eaves	26 58.2 west of south
Lower northeast corner of the Murphy Hotel	53 55.9 east of south

Iloilo, Panay.—The old station was found to be covered by a pile of steel rails, so observations were made at a point 200 feet to the northeast.

A new station was established in the northern part of the military reservation, about one-half mile east of the town plaza. It is 236.9 feet a little to the east of north from the northwestern corner of the most northern of the officers' quarters, 48 feet west from the center of the road along the shore of the bay, 87 feet a little north of east from a boundary post marked U. S., 116.8 feet northeast from a small iron telegraph pole, and 154.6 feet southeast from another small

PHILIPPINE ISLANDS—continued.

iron telegraph pole. The station is marked by a cement post 6 by 6 by 24 inches, projecting 2 inches above the surface of the ground, with a hole in the top to mark the exact spot. The following true bearings were determined:

	° ′
Top of east dome of Catholic Church (mark)	73 00.1 west of north
Spire on tower of Protestant Church	48 11.9 west of north
Top of lookout stand on steel tower of customhouse	70 36.2 west of north
Top of a small lighthouse	44 16.7 east of north
Southwest corner, under eaves, of cuartel built on top of the fort	43 18.2 west of south

Legaspi, Luzon.—The old station was found to be in the center of four railroad tracks which run out to a new wharf. Observations were therefore made at a point about 113 meters south of the old magnetic station, and a new station was established at Albay.

Lucena, Luzon. The station is in the northwest corner of the grounds surrounding the Provincial Government building, about one-half mile south from the town's center. It is 116.2 feet east from the fence bounding the grounds on the west, 117.6 feet south from the fence bounding the grounds on the north, 163 feet southeast from the nearest corner of the large cement fence post at the northwest corner of the grounds, and 123.3 feet north from the center of the drive to the south. The station is marked by the neck of a quart glass bottle buried 5 inches below the surface of the ground. The following true bearings were determined:

	° ′
Lower northeast corner of Provincial Government building (mark)	38 01.6 east of south
Lower southwest corner of Provincial Government building	20 27.7 east of south
West gable, under sheet-iron roof, of high school	79 47.7 east of south
Center of top of dome at northeast corner of jail	68 36.0 east of south

Masbate, Masbate. The old station could not be located. A new one was established in the northwest corner of the municipal plaza, at the northwest edge of the town and about 300 feet southeast from the old blockhouse. It is 115.1 feet southwest from a Bureau of Lands monument, marked P. L. S. B. L., at the north corner of the plaza, 169 feet a little west of south from another Bureau of Lands monument marked in the same way, at the fence corner across the road to the north from the north corner of the plaza and 61.1 feet from a fence to the northwest. The station is marked by the neck of a quart glass bottle buried 6 inches under the ground. The following true bearings were determined:

	° ′
Top of lighthouse at entrance to Masbate Harbor (mark)	40 21.0 west of north
Northwest gable on roof of house of constabulary lieutenant	56 06.9 east of south
Upper east corner of wall of old blockhouse	20 45.8 west of north

Misamis, Mindanao.—Observations were made as near the old station as was possible.

Owing to the existence of magnetic disturbance there, a new station was established on the parade grounds northwest of the old fort, about 1 mile southeast from the town's center. It is 263.2 feet northwest from the northwest corner of the fort, 365.8 feet northwest from the northeast corner of the fort, and 127.5 feet southwest from the center of the road leading to the entrance to the fort. It is marked by a granite field stone 20 inches long and about 3 inches in diameter at the top, projecting about 2 inches above the ground, and having a cross cut in the top to indicate the exact spot. The following true bearings were determined:

	° ′
Point on south gable of Capistrano's sawmill building (mark)	67 34.3 west of north
Center of lower part of smokestack of Capistrano's sawmill	65 16.8 west of north
North corner of sentry box on north bastion of fort, under eaves	76 05.7 east of south
Upper south corner of south bastion of fort	32 39.0 east of south

Puerto Princesa, Palawan.—The station is in the southwestern part of the parade ground of the military reservation, about one-fourth mile southwest from the town's center, and near to the place where observations were taken by Padre Juan in 1888. It is 339.6 feet west from the southwest corner of the military cuartel, 382.6 feet southwest from the northwest corner of the wall in front of the cuartel, 228 feet southeast from the southwest corner of a small building formerly used to cover a rain-water reservoir, and about 23 feet north from the edge of the rocky bank along the bay. The station is marked by a Bureau of Land monument 6 by 6 by 24 inches, lettered P. L. S. B. L., with a hole in the center. The top of the monument projects 4 inches above the ground and the bottom rests on solid rock. The following true bearings were determined:

	° ′
Top of south tower at front of rain-water reservoir (mark)	57 37.7 east of north
Top of south tower at front of church	65 58.9 east of north
Top of north tower at front of church	62 03.4 east of north
Top point of ornamental triangle at top of south door of schoolhouse	46 16.9 east of north

PHILIPPINE ISLANDS—continued.

Romblon, Romblon.—The station is identical with the astronomic station. It is in the northwestern part of the plaza on the north edge of town. It is 171.5 feet northeast from the northeast corner of the convent wall and 140.5 feet southwest from the southwest corner of Francisco Sanz's store. It is marked by a coarse marble stone elliptical in cross section, which is level with the surface of the ground and has a cross cut in the top. The following true bearings were determined:

	° ′
Top of Sabang lighthouse (mark)	9 45.8 west of north
Top of beacon at north side of bay	30 20.9 west of north
Base of cross on bell tower of church	8 26.2 east of south
Lower southwest corner of municipal building	14 09.5 east of south
Top of beacon at south side of bay	43 19.6 west of north

Declination observations were made also at the old magnetic station, 84 feet southeast of the new station.

San Fernando, Luzon.—The station is in the southern part of the grounds surrounding the Provincial Government Building, about three-fourths of a mile southwest of the town's center. It is 132.9 feet northwest from the center of the cement work which supports the drain on the north side of the road to the south, 98.3 feet north from the fence across the road to the south, and 209.4 feet south from the southwest corner of the Provincial Building. The subsurface mark is the neck of a small glass bottle, buried 13 inches below the surface of the ground. The surface mark is a cement post 8 by 5 by 5 inches, coming to a point at the top, which projects 4 inches above the surface of the ground. The following true bearings were determined:

	° ′
Opening in center of window in top of Catholic Church steeple	49 59.0 east of north
Point at top of a stack with conical cover	50 39.6 east of north
East point at top of roof of high school	58 33.4 west of north
Center of top of cupola on northeast corner of jail	75 21.9 west of north
Base of flagstaff on Manila R. R. Co.'s station	5 41.4 west of north

San Isidro, Luzon.—The station is in the southwestern corner of the grounds surrounding the high school, within the oval of the running track and about one-fourth mile southwest from the town's center. It is 156.4 feet from the south fence, 96.9 feet from the west fence, 39.2 feet southeast from the center of a cement post 3½ by 3½ inches at the top and projecting about 13 inches above the ground on the edge of the running track, 153.7 feet northeast from a similar post, and about 186 feet north from the northeast corner of the wall of the cemetery. The station is marked by neck of a dark glass bottle buried 1 foot below the ground for a subsurface mark and a hollow cement tile 8 by 9 by 16 inches with its upper edge flush with the ground for a surface mark. A cross cut in the concave top indicates the exact spot. The following true bearings were determined:

	° ′
Lower southeast corner of brick wall of cemetery (mark)	10 04.4 east of south
South peak at top of Mount Arayat	54 27.8 west of south
Gable of south window in roof of high school	14 19.6 east of north

San Jose de Buenavista, Panay.—The old station could not be accurately located, and a new station was established near by in the northern part of the grounds belonging to the Bureau of Education, extending to the northwest of the fort now used as a detention camp for lepers, about one-fourth mile southwest from the town's center. The station is in the southeastern corner of the site of an old house or cuartel, the foundations of which can just be distinguished level with the surface of the ground. It is 167.4 feet southwest from the southwest corner of the fence surrounding a native's house on the north corner of the intersection of Calle Real and the first cross street. It is also 23 feet southeast from the center of Calle Real and 91.8 feet southeast from the property line to the northwest. The station is marked by a limestone post 6 by 10 by 24 inches, which projects 3 inches above the surface of the ground and is lettered "U. S." on the top, where a cross with a hole in the center indicates the exact spot. The following true bearings were determined:

	° ′
West point at top of roof of the Alacante house (mark)	64 07.6 east of north
Southwest point of the eaves of the roof on the central public school	41 28.9 east of north
Lower northwest corner of citadel of fort	0 26.8 east of south

Surigao, Mindanao.—The old station could not be located. Observations were taken over the astronomic station, which is in the northern part of the Government lot immediately west of the Provincial Building, in the northwestern part of the town. The station is 157.3 feet west from the northwest corner of the Government Building, 88.4 feet east from the fence bordering the lot on the west and 152.9 feet north from the fence bordering the lot on the south. It is marked by a large block of cement about 3 feet in diameter at the top, upon which is shaped a raised square 6 by 6 inches, lettered "C. & G. S., 1910," and having a triangle surrounding a hole at its center. The following true bearings were determined:

	° ′
Northeast corner of convent, under eaves	31 54.1 east of south
Extreme northeast corner of sheet iron roof on bandstand	39 45.0 east of south
Lower northwest corner of Provincial Government Building	85 56.0 east of south

PHILIPPINE ISLANDS -continued.

Tabaco, Luzon.—The old station could not be recovered. A new station was established on the grounds of the public school, about one-fourth mile south of the town's center. It is 170.4 feet northeast of the southeast corner of the schoolhouse, 185.8 feet southeast of the northeast corner of the schoolhouse, and about 58 feet north of the south boundary of the schoolhouse grounds. It is marked by the neck of a dark glass bottle buried 10 inches below the surface of the ground. The following true bearings were determined:

	° ′	
Base of cross on dome of Catholic Church (mark)	25 50.7	west of north
Lower southeast corner of schoolhouse	62 00.9	west of south
Lower northeast corner of schoolhouse	75 51.0	west of north

Tacloban, Leyte.—The old station could not be reoccupied. A new station was established in the southwestern part of the military reservation (Camp Bumpus), about 300 feet east from the 1-kilometer stone on the road along the west side of the grounds, and about one-third mile southeast from the probable position of the old station. It is 195 feet southwest from the nearest one of a row of trees forming a sort of hedge extending northeast and southwest, and 35 feet southeast from a path which is a continuation of Calle Santo Nino. The station is marked by a cement post 6 by 6 by 20 inches, projecting about 3 inches above the ground, with a cross having a hole in its center on the top to indicate the exact spot. The following true bearings were determined:

	° ′	
Top of beacon at Tacloban (mark)	14 00.6	west of north
Lower southwest corner of old blockhouse	0 53.4	east of north
Lower east edge of water tank on roof of jail	17 29.7	west of north

Tarlac, Luzon.—The station is in the northern part of the grounds surrounding the Provincial Government Building, about three-fourths mile southeast from the town's center. It is 112.3 feet southwest from the nearest point of the bottom of a large cement cylinder for storing gravel, across the road to the north, 117.1 feet southeast from the center of the cement work marked "N. I. 53" for the drain across the road to the north and 174.5 feet a little north of east from the nearest point of the lower rim of the fountain. It is marked by a cement post 24 by 8 by 6 inches, projecting about 5 inches above the ground, with a hole in the top. The following true bearings were determined:

	° ′	
South gable on roof of high school (mark)	5 28.3	west of north
West edge of Provincial Building water tank, under eaves	37 10.8	west of south
Center of base of fountain	67 20.9	west of north

Valle Hermosa, Negros.—The old station could not be located. A new station was established at the southwest corner of the grounds surrounding the new church. It is a little south of west from this church, southwest from the old convent, and about 138 feet southeast from the probable position of the old magnetic station. It is 119.1 feet from the northwest corner and 192.9 feet from the southeast corner of the church. The station is marked by the monument of the Bureau of Lands at the southwest corner of the churchyard. It is 6 by 6 inches at the top and projects 5 inches above the ground, and is lettered "P. L. S. B. L." at the top with a hole in the center. The following true bearings were determined:

	° ′	
Astronomic Station (mark)	32 40.4	east of north
Upper northeastern corner of telegraph station	64 11.9	west of north

UTAH.

Brigham, Box Elder County.—The station is near the southwest corner of the baseball park, one-half mile west of the town's center. It is 59 feet east of the west fence, 123 feet north of the south fence, 73 feet northeast of a ditch, and 143 feet north and a little west of the point where this ditch runs under the south fence. The station is marked by a cement post 12 inches in diameter and about 16 inches long, with a brass plate in the top and sets flush with the ground. The following true bearings were determined:

	° ′	
Spire on courthouse tower (mark)	78 01.1	east of south
Left edge of brick chimney on J. Newtson's house	0 45.0	east of north
West edge of west brick chimney on Christianson's house	37 02.5	east of north

Coalville, Summit County.—The station is on the fair grounds, one-half mile north of town's center. It is west of the ball ground, in line with the south side of the grand stand, and 149 feet west and a little north of its southwest corner. It is 143 feet northeast of the northeast corner of the amusement hall and 46 feet northeast of a large hydrant. The station is marked by a cement post 10 inches in diameter and 16 inches long, with brass plate in top and set flush with the ground. The following true bearings were determined:

	° ′	
Right edge of old brick courthouse (mark)	49 50.4	east of north
Center of U. S. G. S. sandstone bench mark just west of a limestone hill	68 11.0	east of north
East edge of cliff to the north	16 14.3	west of north
Left edge of old courthouse	46 44.4	east of north

UTAH—continued.

Green River, Emery County.—The station of 1905 was reoccupied. It is on land owned by the Denver & Rio Grande Railroad, about one-fourth of a mile southwest of the center of the town, and about 700 feet south of the railroad station. It is about 600 feet southeast of the longitude station of 1898 and south of the Palmer Hotel. It is 348.2 feet south of the southeast corner of the fence surrounding the Palmer Hotel and 389 feet southeast of the southwest corner of the same fence. The station is marked by a redwood post 7 by 5 by 30 inches, projecting 6 inches above the ground. The following true bearings were determined:

	° ′
Spire on western water tank (mark)	5 44.2 east of north
Flagpole on Palmer Hotel	26 34.0 east of north
Spire on eastern water tank	89 13.6 east of north
Apex of pointed hill about 3 miles away	47 51.1 east of south
Left edge of brick chimney on frame house	8 19.0 east of south

Heber, Wasatch County.—The station is on the courthouse yard near the town's center. It is northwest of the courthouse, in line with the south side of the amusement hall and 49 feet east of its southeast corner, also in line with the northwest corner of the courthouse and an elm tree; 71 feet northwest from this elm tree and 52 feet southwest of the southwest corner of the tabernacle. The station is marked by a red sandstone post 5 by 6 by 14 inches with a cross on top and set flush with the ground. The following true bearings were determined:

	° ′
Southwest corner of courthouse just above projecting stone near ground (mark)	28 47.2 east of south
Northeast corner of courthouse just below eaves	42 11.4 east of south
Northwest corner of projecting stone near ground at northwest corner of Tabernacle	38 14.9 east of north
Northwest corner of brick building, southwest of courthouse yard	27 05.0 west of south

Logan, Cache County.—The station is near the southwest corner of the county fair grounds, about three-fourths of a mile southwest of the town's center. It is 34 feet northeast of the southwest fence, 36 feet west of the fence around the outside of the race track, 59 feet north of the north side of a brook, 143 feet south of the southeast corner of a bridge crossing a brook to the north. The station is marked by a limestone post 7 by 7 by 20 inches, with a brass plate in the top which projects 2 inches above the ground. The following true bearings were determined:

	° ′
West gable of dance hall west of the exhibition hall (mark)	36 34.3 west of north
Left edge of cornice on the southeast corner of the exhibition hall	20 24.4 west of north
Northwest corner of judges' stand	17 24. 6 east of north
Center of brick chimney on house southeast of the park	77 58.9 east of south

Morgan, Morgan County.—The station is near the northeast end of Lake Como, about 1 mile east of the town's center. It is 70 feet northwest of the north sulphur spring, 33 feet northeast of the northwest corner of the swimming pool, and 25 feet north of its north side; a large grove and the old dancing pavilion lie just north of the magnetic station. The station is marked by a limestone post 6 by 8 by 14 inches, with cross and drill hole in top and set flush with the ground. The following true bearings were determined:

	° ′
Vertical crevice, 10 feet long, near east end of lower strata (dipping to northwest), on hillside to southwest (mark)	55 32.9 west of south
Tip of large rock in Lake Como	45 31.2 west of south
Left edge of crevice near center of rock directly above the springs	1 49.2 west of south

Ogden, Weber County.—The station of 1905 was reoccupied. It is about half a mile west of the west bank of Weber River, west of the Southern Pacific Railroad station, and just south of two piers. These piers formed part of an observatory which has disappeared. They are about 5 feet high and 1½ feet square, and the eastern pier is inscribed with the latitude, longitude, and elevation. It is also marked with the name Wheeler, U. S. A., 1873. The station is 45.4 feet south of the southeast corner of the east pier and 46 feet from the southwest corner of the west pier. The station is also 99 feet from a fence corner to the south. The station is marked by a concrete post 6 by 9 by 13 inches with a cross and drill hole in the top, and set flush with the ground. The following true bearings were determined in 1905:

	° ′
Methodist Episcopal Church spire	80 31.8 east of north
Catholic Church spire	81 10.8 east of north
Spire of Union Station clock tower	84 38.0 east of north
Flagstaff on Grand Opera House	88 49.7 east of north
Center of a high brick smoke stack	58 02.6 east of north

UTAH—continued.

Provo, Utah County.—The station is near the west center of the North Park, about one-half mile north of the town's center. It is 202 feet east of the west fence, 345 feet north of the south fence, 215 feet east and a little south of the west gate, 355 feet northwest of a cement drinking fountain by the south gate, 26.5 feet north of a poplar tree, and 6.5 feet south of an ash tree. The station is marked by a Bedford limestone post 6 by 6 by 20 inches, with brass plate in top, which projects 2 inches above the ground. The following true bearings were determined:

	° ′
Right edge of top of large "Y" on mountain side (mark)	79 15.2 east of north
North gable of old mill	74 28.9 east of south
Northwest corner of brick house south of park	33 05.7 east of south
Southeast corner of house north of park	15 36.6 west of north
Southeast corner of cement swimming pool (1 foot above ground)	67 13.2 east of north

VERMONT.

Bennington, Bennington County.—The station is on the grounds of the State Soldiers' Home, about one-third mile north of the village center. It is in the central part of the plot west of the walk to the home. It is 93 feet north from a large elm tree in the lot, 123 feet west from a large elm tree between two maple trees near the walk, 16 feet east of the line between the first-mentioned elm and the band stand, and 216 feet south of a large pine tree across the road from the band stand. The following true bearings were determined:

	° ′
Cupola on brick mill (mark)	70 21.3 west of south
Concrete house with red roof on distant hill (most prominent peak on roof)	40 30.5 west of south
Peak of roof of band stand	4 10.9 west of north
Northeast corner of gray elevator	54 23.5 east of south

Rutland, Rutland County.—The station of 1905 and 1910, on land of the city home for the poor, just south of the graveyard, was reoccupied. From the station northwest to the southwest corner of the graveyard fence is 47.9 feet; northeast to the southeast fence corner is 72 feet. The station is marked by a white sandstone rock, letters U. S., 1905. The following true bearings were determined in 1910:

	° ′
North gable of barn (mark)	7 06.9 west of south
Highest east gable of city poorhouse	58 02.8 west of south
Top of water tower	4 23.5 east of north
West gable of yellow farmhouse	80 11.8 east of south

Wilmington, Windham County.—The station is on the grounds of the high school, about one-fifth of a mile southeast of the village center. It is 101 feet west of the west corner of the school, 121 feet from the north corner of the school, 25 feet southeast of projection of east side of school, 65 feet from stone wall, 35 feet from the westernmost of three flat rocks, and 74 feet from maple tree about 65 feet west of school. The station is marked by a 4-inch tile, set flush with the ground, with a bronze magnetic station marker cemented in the top. The following true bearings were determined:

	° ′
Steeple of yellow church (mark)	42 19.5 west of north
Steeple of Masonic Temple	19 30.0 west of north
Cupola of drab barn across Main Street	30 31.4 east of north

VIRGINIA.

Cape Charles, Northampton County.—Observations were made at the station of 1910. It is 160 feet north of the north side of the extension of Tazwell Street and about 10 feet southwest of a pine stump 3 feet in diameter. The station is marked by a marble post 8 by 8 by 40 inches, lettered U. S., 1910, and projecting 4 inches above the ground. The following true bearings were determined:

	° ′
West edge of top of more westerly of two chimneys very close together on Sandy Island (mark)	9 20.4 west of north
Apex of light at house on bay end of stone pier	53 44.9 west of south
East edge of cupola of house, at junction with roof	6 48.0 east of south
East gable of small house at shore end of stone pier	18 52.3 west of south
East gable of coal elevator beyond railroad station	19 41.8 east of south

WASHINGTON.

Seattle, King County.—The new station of 1910 was reoccupied. It is in the eastern part of the grounds of the State University. It is 208.6 feet northwest from the northwest corner of the girls' dormitory and 198.7 feet southeast from the southeast corner of the boys' dormitory. It is marked by a granite post 48 inches long, 8 by 8 inches on top and 12 by 12 inches at the bottom, projecting 14 inches above ground, and lettered U. S. C & G. S., 1903. The following true bearings were determined in 1910:

	°	′	
Center of wooden block at north top end of roof of Science Hall (mark)	76	03.2	west of south
Center of rod at top of north gable window on Denny Hall	80	31.8	west of north
Top of southwest edge of white water tank	41	41.0	west of north
Central point at top of roof of California Building	10	42.9	west of south

WISCONSIN.

Appleton, Outagamie County.—Observations were taken at the old magnetic station on the infield of the race track at the fair grounds. It is almost on a line west of the center of College Avenue. The station is 73.4 feet north and slightly east of the north one of two hickory trees within the inclosure, and 185 feet west from the inside fence of the race track. The station is marked by a white marble post 4 by 6 by 24 inches, set flush with the surface of the ground and lettered U. S. C. & G. S., 1908. The following true bearing was determined:

	°	′	
Top of St. Joseph's Church steeple (mark)	86	43.7	east of south

Balsam Lake, Polk County.—The station is in the southern part of a field, about 1½ miles north across the lake from the town's center. This field belongs to William Taylor, and extends east and north from the lot surrounding his house. The station is 152.1 feet east from the fence on the west border of the field and 184.3 feet southeast from a cross cut about 1 foot above the ground in the trunk of a tree just over the west fence. It is marked by a limestone post 5 by 6 by 30 inches, projecting about 6 inches above the ground, with a bronze magnetic station marker in the top. The following true bearings were determined:

	°	′	
West gable of cabin at north end of the field (mark)	2	54.4	east of north
West gable of log barn at north end of the field	2	47.4	west of north
Lower northwest corner of Dana Cooledge's house	80	45.2	east of north
North gable of Dana Cooledge's boathouse	79	05.8	east of south
North gable of William Taylor's barn	71	27.8	west of south

A meridian line was set along the west fence of the field, and about 3 feet east of this fence. The line is marked by two 1-inch iron pipes, each 3 feet long and showing about 1 foot above the ground. The south meridian post is about 150 feet a little north of west from the magnetic station, and the line is about 300 feet long.

Birchwood, Washburn County.—The station is in the southwestern part of the village park, about in the town's center. It is 112.9 feet from the fence across the road to the south and 102 feet from the property line on the west side of the park. The station is marked by a limestone post 5 by 6 by 30 inches, projecting about 4 inches above the ground, and having a brass magnetic station marker in the top. The following true bearings were determined:

	°	′	
Top of cupola of storage warehouse (mark)	38	51.0	east of north
Top of cupola on the schoolhouse	78	24.9	east of south
Upper southeast corner of Birch Lake Inn, under eaves	19	20.2	east of north
Top of Chicago, St. Paul, Minneapolis & Omaha R. R. water tank	6	00.0	east of north

The north meridian point is a cross cut in the top of a rough sandstone post about 4 by 8 by 36 inches, which projects about 7 inches above the ground. It is about 420 feet from the magnetic station in the center of the ridge between the main track and the side track of the Minneapolis, St. Paul & Sault. Ste. Marie Railroad.

Blackcreek, Outagamie County.—Observations were made in the northeastern part of the grounds surrounding the Catholic Church, about 800 feet southeast from the railroad station.

Clintonville, Waupaca County.—The station is in the northwestern part of Bucholtz Park, about 250 feet west of the bandstand and about 1 mile southeast of the town's center. It is 59.8 feet northeast of the southeast corner of a pasture fence to the west, 56.1 feet a little west of south from a cross blazed about 2 feet above the ground in a tree trunk, 55.7 feet southeast from a cross blazed about 3½ feet above the ground in another tree trunk, and about 46 feet from the center of the road to the south. It is marked by a limestone post 5 by 6 by 30 inches, projecting about 6 inches above the ground, and having a bronze magnetic station marker in the top. The following true bearings were determined:

	°	′	
Top of Bismark Church steeple (mark)	37	09.6	west of north
Top of cupola on Stevens & Co.'s cheese storehouse	36	40.1	west of north
Top of cupola on a dwelling	77	34.4	west of north

WISCONSIN—continued.

Cumberland, Barron County.—The station is in the northwestern part of the old fair grounds, about 1 mile southeast from the town's center. It is 105 feet southeast from the nearest point on the circular exhibition building, 116 feet southwest from the southwest corner of a barn, and about 135 feet south from the fence on the north border of the ground. It is marked by a limestone post 5 by 6 by 30 inches, projecting about 5 inches above the ground, and having in its top a bronze magnetic station mark. The following true bearings were determined:

	° ′
Top of Evangelical Lutheran Church steeple (mark)	80 27.2 west of south
Top of town water tank	47 13.7 west of north
Top of Cathôlic Church steeple	46 23.0 west of north
Top of cupola of high school	45 37.2 west of north

Frederick, Polk County.—The station is on the north shore of the pond, about one-half mile east from the town's center. It is about 430 feet north from the edge of the pond, about 600 feet east from a small cabin for storing dynamite, 36.9 feet northwest from a cross blazed about 1 foot above the ground in the trunk of the largest lone tree in the neighborhood, and 210.7 feet northeast from the center of the trunk of a tree blazed with a cross having two galvanized nails driven in its vertical arm and about 5 feet above the ground. The station is marked by a limestone post 5 by 6 by 33 inches, projecting about 5 inches above the ground, and having a bronze magnetic station marker in the top. The following true bearing were determined:

	° ′
Top of cupola on woolen mill (mark)	67 36.9 west of south
Two galvanized steel nails set in a blazed cross in a tree trunk 210.7 feet distant	54 57.2 west of south

Green Bay, Brown County.—The station is in the northwestern part of a field used as a baseball ground, about 2½ miles southeast of the town's center, and about three-fourths of a mile southeast of the old magnetic station. It is across the south bridge of the East River, at the northeast corner of the intersection of the road across this bridge and the first road to the east parallel to East River. The following true bearings were determined:

	° ′
Top of a belfry (mark)	60 14.3 west of north
Base of cross on steeple of Polish Church	75 59.0 west of north
Top of cupola of Park Clubhouse	20 09.7 west of north
Base of cross on steeple of East River Church	2 20.3 west of north

Hurley, Iron County.—The station is in the southeastern part of the infield within the race track at the Ironwood fair grounds, about 1½ miles north of the town's center. It is 116 feet north and 146.9 feet west of the fence bordering the race track on the inside, and 277.4 feet southeast of the southeast corner of the judges' stand. It is marked by a limestone post 5 by 6 by 30 inches, projecting 6 inches above the ground, and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′
Base of cross on most easterly of three church steeples	56 20.3 east of south
Base of cross on central one of three church steeples	53 46.0 east of south
Top of the westernmost of three church steeples	49 09.6 east of south
South gable of the grandstand	78 31.3 west of north

Ingram, Rusk County.—The station is in the western part of a field belonging to the Ingram Lumber Co., which is the next field to the west of the ground surrounding an old building marked "Hotel Donk" with its barns and outhouses. It is about one-half mile northwest from the town's center, 180.6 feet south and 177 feet east from a curved fence on the northwest border of the field. It is also 22.2 feet southwest from the center of a tree stump blackened by fire. The station is marked by a limestone post 6 by 5 by 30 inches, projecting 5 inches above the ground, and having a brass magnetic station marker set in the top. The following true bearings were determined:

	° ′
Base of cross on Catholic Church steeple (mark)	33 00.5 east of south
Top of cupola of schoolhouse	40 16.6 east of south
North gable of the Kearny house	36 53.1 east of south
Top of cupola of the hospital	30 15.7 east of south

Ladysmith, Rusk County.—The station of 1907 was reoccupied. It is in the southeast corner of the courthouse square, 44.5 feet from the inner edge of the sidewalk on the east, 76.5 feet from the inner edge of the sidewalk on the south, and 79.2 feet from the southeast corner of the courthouse. It is marked by a cement post 2 feet long and about 3 by 5 inches at the top. The following true bearings were determined in 1907:

	° ′
Steeple of German Lutheran Church (mark)	84 18.7 west of north
Cupola of schoolhouse	81 04.0 west of north
Cupola of Mr. Thomas's house	3 12.4 east of south

WISCONSIN—continued.

Mellen, Ashland County.—Observations were made in the southern part of the grounds surrounding the high school, about one-eighth of a mile south of the town's center, and about 237 feet south of the south door of this school. The following true bearing was determined:

	° ′
Top of Union Church steeple (mark)	23 59.8 west of south

Park Falls, Price County.—The station is in the northwestern part of a pasture belonging to Mr. Lordell, which is the second inclosure to the south of the baseball grounds, on the east side of the road past the front of the high school. It is about one-half mile south from the town's center, 71.1 feet south from the north fence of the pasture, and 185.5 feet east from the west fence of the pasture. The station is marked by a limestone post 5 by 6 by 30 inches, with a brass magnetic station marker set in the top, and projecting 6 inches above the ground. The following true bearings were determined:

	° ′
Top of paper mill water tank (mark)	24 35.8 east of north
Upper west edge of smokestack of paper mill	23 43.0 east of north
South gable of a house across center of baseball field	2 09.9 east of north
Top of cupola of high school	18 02.6 west of north

Rice Lake, Barron County.—The station is in the northwestern part of the infield within the race track of the Barron County fair grounds, about three-fourths mile northwest of the town's center. It is about 230 feet south and about 244 feet west from the curved board fence at the northwest border of the ground. It is marked by a limestone post 5 by 6 by 30 inches, projecting 4 inches above the ground, and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′
Top of tallest steeple of St. Joseph's Church (mark)	3 31.3 east of south
West gable of grand stand at fair grounds	43 35.6 east of south
Top of ticket booth at gate of fair grounds	38 22.8 east of south
South gable on red exhibition building	78 06.7 east of north

Saxon, Iron County.—Observations were made in the southeastern part of the pasture through the wooden gate at the west end of the road on the north side of the railroad tracks, about one-fourth mile northwest of the town's center.

Seymour, Outagamie County.—The station is in the southwestern part of the infield of the race track at the fair grounds, about one-half mile northwest of the town's center. It is 100.3 feet north and 239.6 feet east of the fence surrounding the race track. The station is marked by a limestone post 5 by 6 by 30 inches, with a brass magnetic station marker set in the top, which is about 4 inches above the ground. The following true bearings were determined:

	° ′
Spire of Congregational Church (mark)	27 45.9 east of south
Top of Lutheran Church steeple	31 02.8 east of south
Base of cross on Catholic Church steeple	8 19.0 east of south
Top of belfry on schoolhouse	32 20.8 east of south

A rough limestone post 4 by 6 by 28 inches, projecting 5 inches above the ground, was set 331 feet distant and 47 feet south of the fence on the north border of the fair grounds to mark the true meridian.

Observations were also made in the northwest corner of the southwest field on the farm of Albert Storm, about 1¾ miles northeast of the fair grounds, in order to investigate the reported local disturbance at that place.

Tomahawk, Lincoln County.—The station is in the northern part of Bradley Park, about one-half mile southwest of the town's center. It is on the west side of a road which winds past the Marinette, Tomahawk & Western Railroad station and the boathouses, in an open space on a low hill immediately south of where another road branches from the above. Its position is referred to the two tallest pine trees on the hill. It is 142.5 feet southeast from a cross blazed about 1 foot above the ground on the trunk of one of these trees, and 149 feet a little east of south from a cross blazed about 1 foot above the ground on the trunk of the other tree. It is about 94 feet from the center of the road to the east, and 59 feet northwest of a hole in the ground about 5 feet deep. The station is marked by a limestone post 6 by 5 by 30 inches, projecting 3 inches above the ground, and having a brass magnetic station marker in the top. The following true bearings were determined:

	° ′
Top of square cupola on city hall (mark)	56 52.7 east of north
East gable of Marinette, Tomahawk & Western R. R. station	14 19.2 east of north
West gable of the warehouse	5 06.9 east of north

Van Buskirk, Iron County.—Observations were taken in an open field at a spot about 500 feet northeast of the railroad station, and about 200 feet north of a large rock partly covered with earth to form a small hill.

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U.S. Coast and Geodetic Survey
Terrestrial magnetism

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